



## Original Correspondence.

## THE SOUTH WALES COAL FIELD.

SIR.—Several communications have recently appeared in the Journal respecting the evidence I gave before the Committee of the Lords, on the Aberdare and Central Wales Bill, as to the quantity of coal contained in the Hirwain Coal and Iron Company's property. My evidence on the Bill in question occupies 16 quarto pages in the official shorthand report of the proceedings, and is there correctly reported as "millions" in every case. In no single instance did the word "billions" escape my lips. Had it have done so, with the bitter opposition we had to contend with from the Great Western, you may rely upon it the eminent counsel engaged in that company's interest would not have lost the fine opportunity such a slip would have given them, and we might not have come off so triumphantly as we did with our Bill, their Lordships deciding in our favour, without even calling on our counsel, Mr. Harcourt, for a reply.

I certainly thought some of your correspondents would have referred to an authentic report of my evidence before wasting their own and your readers' time with their comments and calculations, which, being founded on incorrect data, are valueless.

For your own satisfaction, Mr. Editor, I have sent you a map\* showing the acreage of the Hirwain Company's property, and a section of the coal seams, by which you can readily verify for yourself the accuracy of my statements, if you apply the ordinary rule that every foot thickness of workable coal yields 1000 tons per acre.

Swansea, Aug. 1.

THOMAS C. HINDE.

\* This is a carefully executed map, describing an area of nearly 1000 square miles, and embracing from Swansea to Newport in the one direction, and from Cardiff to beyond Hirwain in the other, which has just been completed by Mr. Leyson Rhys, C.E., of Hirwain. The map not only shows the favourable position, commercially considered, of the Hirwain Coal and Iron Company's property, but the relative location of the other coal and iron works of the district. The scale chosen being 1 inch to the mile, the map is very legible; whilst, from the large amount of information it contains, it cannot fail to prove interesting to all engaged in the development of the minerals. The map is accompanied by a section showing the seams of coal below the property, with their relative thickness and position, and some interesting statistics relative thereto are also given. The aggregate thickness of the coal seams beneath the property is 47 feet, and the aggregate extent of the property is 5018 acres, the Hirwain Common estate 3317 acres, and the Rhigos estate 1701 acres. The iron made at the Hirwain works in one year was—pig-iron, 26,182 tons; metal, 11,849 tons; and padded bars, 14,374. The limits of geological formations are likewise shown on the map.

## COAL TRADE—ENGLISH AND FOREIGN—No. II.

SIR.—With the view of avoiding prolixity in the statement of the French demand for English coal, I shall summarily dispose of those districts where English coal is consumed in limited quantities for special purposes (principally for mixing in gasworks), and where no important addition may be anticipated to the present supply. These are the whole of the eastern, the central, southern, and most of the extreme northern districts, with the exception, perhaps, of some of the ports of the Atlantic and Mediterranean seaboard. In competition with the Belgian and French Mines, the English coal has obtained a firm footing, by virtue of its superior quality, and, notwithstanding the proximity of the Mons and North of France coalfields, in the markets of the north-west, through Dunkerque, Calais, Boulogne, St. Valery, and Dieppe; while at Rouen the English coals have succeeded in nearly excluding the supply from other quarters. At Nantes there is the formidable opposition of the Loire coal fields; but the quality of the produce is so much inferior to the English that, with any considerable reduction in freight, we might expect to quadruple the orders received from that port, as well as from Bordeaux, where we are in opposition to the St. Etienne and other southern coal fields. Those who have attentively followed the progress of this trade, and studied the indications of augmenting demand, will readily admit that the ground which remains from these exceptions is sufficiently large to admit of the increase I stated in my preceding letter of 2,000,000 tons annually. I do not speak of remote eventualities, for I believe that ultimately 10,000,000 tons will be nearer the mark of what we shall have to contribute to France, but of the present and immediate requirements of the case. The markets in question are those of Paris and its surrounding towns, and all the towns whose traffic finds the most convenient passage through the valley of the Seine.

Until the present time there was quite another consideration than the comparison of our coals in price and quality with their rivals. Wood, as a fuel, has been from time immemorial the exclusive subject of domestic consumption, although so immeasurably disadvantageous with respect to the economy of cost and calorific. The prejudice of the consumer, and some reasonable points of preference, assisted the resistance to the adoption of coal in household use. There was also the objection as to the existing fues and stoves, which were ill-contrived to carry off the smoke, or rather to give the necessary draft and distribution of flame for a comparatively perfect combustion; and then the gaudy decoration of apartments, so essentially part of French life, suffered immensely from coal smoke, and from ashes cast about by every gust of wind. Notwithstanding all these causes of repulsion, the introduction of coal is steadily advancing in dwellings, the remaining obstruction being that of price, which continues at a figure sufficiently high for the vast majority of consumers to make the objections overbalance the advantages.

The average price of coal in Paris, including all charges, is 50 frs., or 2*l.* In other towns it varies from 45 frs. to 55 frs., according to the means of transport and town dues. The consumption in the districts we refer to amounts to about 2,500,000 tons. When the price can be reduced to (say) 30s. per ton the demand will be doubled. But the Belgian and French coal fields cannot sufficiently increase their yield to meet that contingency. As it is, in order to compete with the English coals, they forward the veriest rubbish, if it be only black, which, betimes, excites the intense disgust of the Paris dealers. And, again, the railways, with every effort to extend their means of traction, are even now publicly proclaiming their inability, by notices repudiating responsibility for prompt delivery. Looking around for other sources of adequate supplies, there are none from which they can be drawn but our own coal fields.

Here it is, then, the problem how to comply with the condition of the price I have named. That is all a question of freight, which involves a regular and continuous traffic impossible under present circumstances (indeed, it has been always so) of the freight market. All the other items of cost, such as discharging, octroi or town dues, cartage, and commission, may be considered as for the present fixed charges, and affecting equally all fuel, so that the onus of reduction must be shared between the mine and the ship.

In many cases the colliery proprietor is also steam-ship owner, and at Rouen, Dieppe, and other ports there are importers who find their account in freighting colliers. This is but within a small limit of what might be effected by a well-organised service. Besides, the present arrangements with regard to the class of colliers employed and the transit forward do not admit of that reduction of price which in every commodity is calculated to turn the balance in favour of consumption. It is needless at the present day to say that the uncertainty of delivery, especially in winter, and the fluctuations in freight by sailing vessels, wholly preclude any effective action, save only by steam colliers. Several attempts since 1854 have been made to push this trade, but as yet, owing to this difficulty of freight, only a very partial success has resulted. We have seen during the present year the formation of a company to act upon the plans of the original attempt to effect direct communication to Paris by sea-going steamers, but the promoters failed to obtain the required capital. At all events, though six months have elapsed no signs of vitality are shown, and it is fair to presume that the scheme is abortive. There remain three other projects in preparation.

By the first it is designed to employ vessels of 300 tons to carry coals from the North and from Paris without transhipment. There are many reasons why this operation is questioned, the principal being that the class of vessels does not afford a paying tonnage for coals; and the next is that the difficulties of navigation in the Seine, above Rouen, are ignored by the promoters of this scheme, otherwise there is no doubt that the principle is right. The second plan is merely the effective organisation of the present system, with steamers of 600 or 700 tons, involving transhipment in France, and adopting Rouen as the port of arrival, so as to take advantage of the water-carriage by the Seine, which is less costly, and causes less

depreciation in unloading and carriage, than the railway transit. The only objection to this is the transhipment, for if the arrangement answer to the extent (partial and inadequate as the means are) of forcing into these markets a very large and progressing trade, there can be little doubt of the same success for a well-managed and regular line of steamers. The last is certainly the boldest and the grandest, for steamers to carry 3000 (not 300) tons, and each working 10 steam-cranes in discharging. The programme of this line is to tranship at Havre into lighters, which will be towed up to Paris, and these in return will sweep the Seine of back-freight at a mere nominal rate. There are certain practical difficulties in the way of this last. But, although I am not one of those who reject the word "impossibility," the design is rationally and practically feasible, only it appears very probable, from my point of view, that at some moment of pressure for ocean-tonnage this class of vessel will be found to pay better in some other employment, and thus both the coal-owner and consumer may be left in the lurch. There is also the disadvantage of these monster colliers (very little short of 4000 tons measurement) being restricted to one or two ports at either side—at all events, they cannot go where the owners may like either to ship or unload cargo. The amount of sea-risk also is no inconsiderable feature; the failure of arrival to the extent of 3000 tons would be a serious block in business; and as vessels of that class can only enter Havre with spring tides, at the top of full and change, the arrivals must be fortnightly, which would give a very small chance of back-freight. I express no opinion as to the superiority of any of these alternatives; I believe that if all were working they would find quite enough to do. My object is to invite attention to the subject, and to suggest the propriety of supporting the first undertaking, by which it can be demonstrated to practical minds that profit will result. If I were to add a word of special advice, it would be to the colliery owners. They should, in order to rely on that absorption for their yield, have a large interest in such a concern, for assuredly if they do not, the trade will, sooner or later, pass to the first competitor who may interpose between them and the steam company formed for this enterprise.

R. M.

## COLLIERIES AND COLLIES—No. III.

SIR.—The state of a mine-atmosphere under such conditions is to be next considered. Mr. Vivian speaks of the internal heat of the earth as a phenomenon of no importance to the collier. In the deepest mines, he says, no inconvenience is felt from excess of heat, because the currents of air constantly circulating through them cool the rocks, and prevent injury to the populations whose business is to live and work among them. As the experiments which led to the discovery of the law of internal heat were made in bore-holes, through which no air could pass, the results, it is said, are inapplicable to mines through which an atmosphere is constantly flowing; the current being continuous so long as the descending column of air is heavier than the ascending. This passage of air through the heated rocks has a tendency to cool them, but the cooling is done by the absorption of sensible heat in the mine-atmosphere in which the collier works. The cooling process is slow, because heat continues to rise from lower ranges of rock and higher temperatures, but the absorption of heat by the air is rapid, and in deep mines may prevent work. Mr. Vivian says it is easy to convey fresh air to the miner at the great depths of which he speaks, "in such abundance, and at such low temperatures," as to "practically dispose" of the fancied interference of terrestrial temperature with deep mines. But if the possibility of thus sweeping the air-ways with a strong current of cool air, instead of the torrid blasts anticipated by science, were proved, the certainty of the intolerable heat of other parts of the mine would remain.

I may here suggest the importance of determining the temperature at which air should enter a mine. If cold air absorbs heat more rapidly than those of higher temperatures, some advantage will be gained by admitting into the hottest parts of the mine atmospheric currents, artificially reduced if necessary, there to linger till the absorbing power is greatly reduced, and then to hurry their discharge. But let it be remembered that what the mine-atmosphere absorbs directly affects the collier, reducing physical strength, and possibly acting upon the vital powers.

Mr. Hull says—"The temperature of a coal mine at the depth of 4000 ft. will probably be found as high as 120°, but there is every reason to believe that by the agency of an effective system of ventilation the temperature may be so reduced, at least during the cooler months of the year, as to allow of mining operations without unusual danger to health." But if the rapid absorption of heat by an atmosphere be in some proportion to the lowness of its temperature when it enters the mine, it may be a question of vast importance to determine at what temperature it should enter, so as to prevent suffering to the workmen from an over-heated medium, as well as from radiation. The time of cooling depends on the temperature of the atmosphere by which the body is cooled, and the rise of temperature in the absorbing body is in proportion to the rapidity of cooling. If it be also true that the colder the air when it enters a deep mine the higher is the temperature when it has taken a long current in the air-ways and passages, no stronger or more serious objection can be raised to the possible success of deep mining.

In connection with this subject, it may be worthy of remark that in estimating the absorbing power of a mine-atmosphere it will be necessary to consider how much it may be modified by intermixing with other gases, some escaping from the coal beds and bituminous shales, and some developed by combustion and the presence of animal life. Other questions will be suggested to the man who seriously undertakes the investigation of the subject by experiment. It may, for example, be important to determine the law of atmospheric absorption in relation to the velocity of the absorbing body. In deep mines this velocity will be ever in part governed by the requirements of life and the demands of work, but it may be no less essential to place it under control for the regulation of temperature by a law of absorption. Attention will also be drawn to the investigation of the influence of physical structure and mineralogical conditions upon the conducting and radiating power of rock masses in the mine, and consequently upon the temperature of that circulating medium which is ever bounding and rebounding along their surfaces. If the aid of science be sought in these and many such enquiries, as a better guide to truth than guessing, it will give efficient instruction. But as rocks above and below the strata exposed in the open spaces of a mine have an influence, by conduction and otherwise, in the production of observed effects, the variations and exceptional phenomena of temperature in some localities will never be fully explained.

By way of illustration, it may be useful to trace the effects produced upon the atmosphere flowing through a few well-known coal mines of greater or less depth. We accept, in preference, those quoted by Mr. Vivian, though we regard them as exceptions selected to support his opinions, and not as illustrations of ordinary effects. "Experiments in one of the collieries of my firm," he said, "conducted from May 25 to June 9, showed that while the mean temperature of the surface was 60°, at the bottom of the pit, at the moderate depth of 480 feet, it had fallen to 55°. The air then passed along the strata for 300 yards, and descended an engine plane till it reached the total depth of 1200 feet, at which point the temperature attained was 61°. When the air had passed through the workings, had done its duty, and had returned to the upcast, it was only 63°. Therefore, in an exceedingly large colliery, at a depth of 1200 feet, the actual addition to the temperature was only 3°. When the surface temperature was 67°, the air at the bottom of the pit was found to be 59°, at the bottom of the engine plane it was 61°, and just before it left the pit it was only 63°, or actually cooler than when it descended."

Mr. Vivian does not say when this colliery was opened, what processes have been continuously adopted for cooling it, nor what differences of result have been observed when comparing past and present conditions. The size of the colliery proves that it has been opened many years, but as the phenomena are exceptional, the history is comparatively unimportant. Mr. Vivian will not, however, desire us to suppose that in the ordinary condition of mines, and at all atmospheric temperatures, the sensible heat is reduced in descending a pit 480 feet deep, though such an effect is frequently produced—that the air escaping from an upcast shaft has the same temperature within 1°, whether the air enters the downcast at 50°, 60°, or 67°, or that it is a customary condition of ventilation for the ascending cur-

rent to be colder, and, therefore, denser and heavier than the descending.

The deep colliery of Messrs. Knowles and Son, near Manchester, is mentioned by Mr. Vivian as another instance of deep mining without an inconvenient increase of temperature. "The air at 68° descends 2088 feet, and then attains the temperature of only 72°, and after passing all the workings only reaches 75°." Messrs. Knowles are of opinion that a very small proportion of the increase of 7° is due to the heat given off by the strata, but that it arises from the heat of men, horses, and lights." To the facts here mentioned no objection is made, they are in the highest degree honourable to the management of the mine, but as proofs or illustrations they are almost useless, for other data are necessary to determine their value. The age of the mine, which would give the time of cooling, is unrecorded—the temperature of the air from the upcast shaft in relation to the temperature when it enters the mine are unknown, and respecting the temperature of the air in close headings and chambers distant from the air-ways the reporter is silent.

The Shireoaks Colliery is mentioned by Mr. Vivian as another instance of low temperatures in deep mines. It is 1530 feet deep, and "the air which enters at 63° is only 69° when it makes its exit." This also appears a small increase of temperature for the depth, but Mr. Hull gives other particulars of the colliery, and the additional information he supplies is interesting. "According to calculation," he says, "the temperature in Shireoaks Colliery ought to be 77° 45'. The intake air (the air at the bottom of the shaft) was 63°, while the return air was 69°, or 6° higher, certainly a moderate increase of temperature, but, be it remembered, after a comparatively short circulation. In a goaf or chamber removed 7 yards from the air-current, the temperature was 72°, being an increase of 9° upon the intake air. Lastly, in a close heading, 80 yards from the air-current, the temperature was found to be 86°, or no less than 23° higher than that of the intake air. As the temperature of the return air which has passed through the workings was 69°, or nearly 10° under that due to the depth, we may conclude that the general effect of the ventilation would be to reduce the temperature by about 10°."

Enough has been said to show the folly of approaching this subject with dogmatic assertion, as if the laws of Nature could be set aside by the necessities of human wants, and the commercial interests of individuals or communities. Experiments made in coal pits and along the highways of mines may not, in all instances, entirely agree with calculations, founded upon the ratio of increase in terrestrial temperature. But neither the existence of the law, nor the accuracy of the calculation, is disproved, because heat is absorbed by the atmosphere flowing through the air-ways. The mining engineer has been taught, perhaps by a lady's fan, that currents of air have a cooling effect on heated bodies, so he has provided for their circulation through the passages he forms underground, that they may sweep off and carry away the invisible streamlets of heat undulating through the subterranean atmosphere, like feeble sounds upon the drowsy air of night.

We have yet another possible source of increased atmospheric temperature to consider. The weight or pressure of a volume of air gives an increase of density to the lower strata, and density develops sensible heat. When air, for example, enters a deep pit, the density and the disengagement of sensible heat, which is a consequent or attendant phenomenon, increases in proportion to the depth. In a column of air the temperature is easily measured, but the effect is no less evident when a bar of cold iron is hammered on an anvil. Experiment has proved the increase of temperature in a column of air to be 1° Fahr. for 300 feet in depth. This being true—and who shall doubt truth in figures, and constancy in the laws of Nature—the increase of temperature from increase of density at the bottom of a vertical atmospheric column, 8000 feet deep, is equal to 26° Fahr. But if we bear in mind that we are speaking of an elastic fluid, we discover conditions which have a tendency to prevent the increase of density, and, consequently, the development of that sensible heat of which it is the attending phenomenon. When a current of air enters a pit, the absorption of heat begins so soon as the temperature of the rock is higher than that of the descending column of air. The effect of this absorption of sensible heat is expansion, by which an increase of density is resisted. I cannot, therefore, agree with Mr. Hull when, in estimating the probable temperature of deep mines, he adds the degrees of sensible heat resulting from increase of density, to the estimated temperature by absorption from the heated strata through which it passes. To value the effect of every condition that disturbs the temperature of a mine atmosphere, without relation to the modification of condition by other causes, and to take the sum of their individual operations as a fair representation of the effect to be anticipated from the combined action of all is, I think, a blunder. In the instance just mentioned the error is apparent. Without attempting at present to measure the result of these two opposing forces, or assuming that one exactly resists the other, it is evidently inaccurate to measure the rise of temperature with density, as if gravitation were the only force, or independent of the antagonistic activity of other agencies. It may also be worthy of remark that if in a deep pit there were a constantly increasing atmospheric density the momentum of the air in its underground channels would be greater than it is; but to the conclusive, unimpeachable testimony of the barometer this important investigation must be referred.

\* In last week's Journal, p. 470, third column, five lines from bottom, when speaking of the dangers to which colliers will be exposed in narrow and confined spaces, it should have been said—"in working at the depth of 8000 feet," &c.

[To be continued in next week's Mining Journal.]

## ON FOSSIL REMAINS.

SIR.—No sooner does Nature attain to its highest beauty and perfection than we behold the symptoms of decay. These we are fully prepared to look for in the works of man—his noblest productions are admired but for a moment, and the finest specimens of his skill bear with them the principle of corruption. But we are surprised when the earth evinces its mutability, when its mountains subside, when its loftiest rivers cease to flow, and when its loveliest scenes are blighted by the hurricane and the storm. Where in centuries past the inhabitants of a burning clime sought shelter from the noon-day rays in every friendly covert, there is now the dreariness of winter. Man himself has left untenanted those regions which he once possessed, and has resigned his dominion to the wild beasts of the forest.

While the contemplation of the sublime propositions of astronomy ennobles our understanding, the world on which we dwell affords ample scope for our powers, by exhibiting to us those members of the animal and vegetable kingdoms which have long been extinct, and by conducting us back in imagination to the time when darkness and chaos overspread a slumbering universe. There are good reasons for supposing that our earth has been in existence for numerous ages, not only from the facts afforded by the science of geology, but likewise from those remains so often found embedded in the unyielding rock. The forest found buried in the soil, with its massive trunks fast moulderling to dust, is a source of pleasing speculation to the philosopher; even if he had viewed it in its pristine state he would have passed its groves with veneration; what then, is his sensation when he reflects on the time that has since elapsed?

England has given to science some of the rarest specimens of fossils. The numerous and large excavations made in different parts of this country have been the means of throwing considerable light on its natural history. The caverns at Kirkdale, in Yorkshire, are much celebrated for the variety of remains found there. On examination, Prof. Buckland discovered of carnivorous beasts, the remains of the tiger, hyaena, bear, &c.; of pachydermata, the rhinoceros, elephant, and others. On surveying such examples as these, we are convinced that numberless changes must have passed over the world. That animals whose nature is only adapted to the heat of a tropical climate should be found in a fossil state in the islands of the Northern Ocean appears almost inexplicable, and it must be either admitted that some catastrophe, such as an universal deluge, removed them from their natural sphere, or there has taken place a radical change in the temperature of certain countries. It is well known that the internal temperature of the earth has often much more calorific than the exterior atmosphere; and this might undoubtedly tend to produce changes in its climate. The presence of fish crustaceans in the hardest rock, and remote from the ocean, cannot be fully accounted for by

**Mosaic deluge;** the most probable supposition is, therefore, that there have been great and universal revolutions in animated nature, and in these have been formed, it would seem, as many distinct creations, each one testifying to the skill and omnipotence of its Creator. We are thus led to suppose that man is comparatively a recent inhabitant of the earth, that ages before his appearance the world was peopled by vast numbers of living creatures, and that the stagnant ocean teemed with life.

Before the creation of man there seems to have existed a species of monsters whose figures appear to us so contrary to Nature's laws as to make us regard them with that abhorrence with which we view the dreams of a disturbed mind; and, indeed, it is quite incredible to suppose that man could have lived in happiness among creatures of such hideous formation as those of which remains have been discovered in the strata of our globe. What would have been our sensations when the very air we breathed was the element which was made the vehicle of their transmission? when every grove that adorned the face of the earth might form the resort of creatures the most terrible and voracious, against whose attacks the arms and ingenuity of man would be comparatively unavailing? Can we suppose that the all-wise Creator would have placed the noblest monument of his beneficence and power in a position of such pain and discomfort? The darkness and devastation which covered the universe before the creation of the sources of light and heat was a fit period for the production of this class of animals; but when man appeared it was expedient that they should be banished from creation, so that harmony and beauty should be everywhere present. And it may be observed that these speculations are not opposed to the Mosaic narrative. We are told that "In the beginning God created the heaven and the earth;" but it is not told us what this beginning signifies. The veil of mystery thrown over the science of geology would induce some to shrink from its consideration; but the enquirer after truth may examine any theory, and any fact, without fear of injury to the cause either of sound religion or of true science.

When we meet with some massive piece of architecture in the recesses of the earth, weadmire the genius and the perseverance of those by whom it was framed. The researches made by geologists have revealed some examples of power and skill of which we had previously no conception, and we should acknowledge the hand of their Almighty framer. Each successive era of our world seems to have witnessed the production of creatures of more symmetrical and perfect natures than before, and the mind of man finds here so ample a field for the exercise of his powers, that after a long life of well-regulated study we think he would have to confess that the great facts of the natural history of the globe were yet unknown, and that all his research, after establishing a few truths, terminated at last in the labyrinth of doubt and speculation.

ALEXANDER HAY.

*Cochœ, via Flerryhill, July 28.*

#### DISCOVERY OF WULFENITE, &c., IN PEMBROKESHIRE.

**SIR.**—It may be interesting to some of your readers to know that I have lately discovered in Pembrokeshire small, but well-formed, tabular crystals of Wulfenite (molybdate of lead), at the Treffgarn Rocks, between Haverfordwest and Fishguard. They occur in small cavities, which are irregularly dispersed through the rock (a felsite, according to the geological map of the district), are of a brown, or honey-yellow colour, semi-transparent, with the edges bevelled, and in form answer to fig. 5 in Phillips' "Mineralogy" (4th edition). I also obtained a substance of greenish-grey colour, disseminated in small veins and patches, which is probably the same mineral in a massive form. Minute, but exceedingly perfect, crystals of tin likewise occur, similarly to those of the wulfenite; but, as far as I have been able to observe, in a separate portion of the rock.

I may as well mention that I have recently found some fine black crystals of blende (sulphide of zinc) at the tunnel near the Patchway Station on the Bristol and South Wales Union Railway. I am not aware that this mineral has been met with before in Gloucestershire, or the neighbouring counties.

SPENCER GEORGE PERCEVAL.

*Henbury, Bristol.*

#### FORMATION OF CARBON, METALS, &c.

**SIR.**—In the Journal of June 30, I asked the following questions:—  
1.—What is carbon?  
2.—At what era of the world did it make its first appearance?  
3.—Could there be living animals or vegetation on the earth before carbon lime rock formed?

Not receiving a reply, I have applied to professors of geology and school teachers, but they do not appear disposed to give any satisfactory answer; and having called on Mr. Tennant, who I found inclined to be very conversant on many subjects, I took the liberty of sending him the following letter, a copy of which I also forwarded to Mr. Hunt, of the Jermyn-street School, by way of having these things investigated and laid before the public, as a guide to the mining Practical and Student:—

**SIR.**—Thinking over your remarks of Saturday, I remember that you said "some clay contained over 50 per cent. of alumina," which observation rather surprised me, seeing the purity of the metal you showed. I notice the sapphire, which is a stone, or rather a glass, said to be composed of 98 per cent. alumina; this is within two parts of the pure metal itself. Then, the Oriental ruby is over 90 per cent. alumina, and this also is a stone. Can this be correct? Is it possible for a pure metal to be turned into a stone by the amalgamation of only 2 per cent., to alter a substance so much? If so, what is this 2 per cent. that has crept in? If this is correct, we have every reason to come to the conclusion that by the same law the diamond is a metal turned into a stone, and which is said to be nearly pure carbon. Then, I ask, do all metals form precious stones? Have you any idea what metal formed the diamond? If alumina will form the sapphire, that may be called a diamond, with only two parts from the metal itself, gold and platinum, and all other metals should form some kind of precious stones or diamonds under the same law. Would not this be worth the study of your schools? Should you make only one more such discovery it would be a stated law, and particularly so if you discovered the diamond was produced from gold or platinum. The diamond being inflammable, could it be formed from sulphur or vitria? Carbon is an inflammable substance, but no one will tell me what carbon is. For what anyone appears to know it may be gold or platinum changed, as the metal alumina must be to form the sapphire or the Oriental ruby, which are only stones, and these must have been formed from moving atoms in gases. Silica I believe to be like clay, a metallic oxide. Sir H. Davy battled with all of the so-called nine earths; he found three or four produced metals, but he could not conquer silica. Were you to bring out the metals of one more of these earths, and the Mining School another, we should be in a fair way of developing Nature's laws, a knowledge of which at present is so much needed.

I am a well-wisher to, and a great supporter of, the progress of Science. Still, I must remark that there appears something singular as to how and where the diamonds and other precious stones are formed, and what from. I never saw or heard of one of the diamond species having been found in rocks or veins. They are all, I believe, found in alluvial soil, and like gold, down near the rock. I have ever believed they were formed where found, like the nodules of iron in clay. In that case it appears to have passed to the place where found as an atomic gas. The mineral of the day being England's principal support. I never contend that it is the duty of those attempting to teach geology and mineralogy to get a careful analysis of all the earth's known layers in England, and lay them down in books, to guide their students, and more particularly the Practicals. It might be done in other countries, but I propose that it should commence in England; it would tend to nearly define the position of every layer of rock, far better than all the shells, and become a most useful guide to what the contents of the strata should be to bear metals. This would aid the Practicals, and would be a step in the right direction.

I may notice that the colour of rock is not of much consequence, as that mostly depends on the quantity of iron it contains; this is little or no guide. The Old Red Sandstone in Devon is nearly blood red, and the same layer in many parts of the world is white or yellow; this mostly depends on the iron it contains. The guide to know any layer is, from the assay to deduct the parts of iron it contains; the residue gives the stratum, and to know if it is mineral-bearing or not. I am now writing my own views on geology and mineralogy; also on lodes, veins, and gossans, with north and south cross-courses or arteries, and the faults and causes. I have for some time past been anxious to obtain the analysis of Cornish granite near good copper lodes; and again, where there are no lodes, and if any unproductive ones. I can get no answer to this question from any of the teachers of geology. I did get one from Scotland, but that is not what Cornish men call granite; it is only Cornish and Devon granite that bears tin. Then, I say, school teachers should also give an historical description of the elvan courses, showing their size, bearing, contents, and effects on lodes; next, give maps of the great known shifts of metallic veins that meet against them, when it will be found that it is not one great general north and south shift or move, as generally supposed, but that nearly every shift varies in distance. Such a work would be worth purchasing by even Practicals. Then let them find out the angle of dip of all the lodes worked on, and show their dip into the earth as far as man has seen them, and put down all others on supposition to be about the same. This would show how the earth's crust is cut up. I notice every true plan or section given on the up or down throws of coal prove that more is to the point of the A up or down; none save myself have laid it down as a law. I wish I could see some bright youth rise like a morning star from amongst such a costly flock as England is now supporting. I should not be inclined to oppose, but, on the contrary, to assist and aid, such a bright and rising youth.—N. ENNOR.

Having been called on from every part of the globe for over ten years to give my views generally on the formation of the earth, with its stratification, arteries, veins, elvan courses, metals, minerals, and gossans, showing what are ore-bearing lodes—maps showing the moves or shifts

of lodes and coals—remarks on the formation of granite and slate, with explanations of difference between the old metamorphic and new transition rocks, and how united, giving many plans and diagrams by way of illustration—with my general views on mines and quarries, and how to work them remuneratively. In publishing my views I disdain to collect them from books, as is generally done by theorists. I write from 60 years' hard practice in different parts of the world, and without fear of contradiction by any man. I am open to meet any one who has had practical knowledge on any one of my subjects. I court opposition, as it tends to bring out facts, confining myself generally to what I know and think are the most essential points for the practical miner to know. There are a few things I have laid down that should ever be the miner's guide. First, that everything in Creation, whether it is the earth generally, or its rocks, layers, minerals, metals, gases, acids, animals, vegetables, or the air they breathe, all originate from a few substances, and all from nearly the same; and these are ever changing—nothing is stationary. The earth has its laboratory, with arteries and veins, much as man, through which all moving matter, or I may say all Creation, passes or repasses from or to the earth's great laboratory; every analysed substance is from there sent through its proper passages to the point required.

N. ENNOR.

#### COAL AND OIL AS STEAM FUEL.

**SIR.**—To my great surprise, I learn by "Engineer's" letter that in using shale oil as steam fuel I intend to turn the furnace-room of a steam-vessel into a distillery, and to make the oil before I use it. Certainly, if engineers can well distinguish the possible from the impossible, there are none who can more coolly bring forward the latter when answering an "Inventor." His remarks about prices, and in the results of the Woolwich petroleum boiler, are about as correct as they are similar in spirit to those he gives on distilling. The struggle of King Coal to maintain his majesty of rule will be a severe one, but I believe the time will come when there will not be such a thing known as a sea-going vessel carrying coal for fuel; and that others are of my opinion, permit me to give the words of a well-known most eminent member of your correspondent's profession, premising that on this subject he goes rather further than I do:—

"To the savage man fuel of any sort, or its use, are incomprehensible mysteries; to a not very remote generation of our ancestors coal, as a substitute for wood or peat, was held a mischievous and deleterious refinement. To some at the present moment the substitution of liquid coal (for what is petroleum but that, minus a little carbon?) presents itself as an equally absurd and preposterous, because new, attempt, yet we venture to predict that a not very distant either will see coal as fuel employed in no other shape but after preparation, and either as liquid hydrocarbon distilled from the raw coal, or as carbonic oxide, and other combustible gases produced from it, and used alone as fuel."

C. J. RICHARDSON.

#### LOW PRICE OF TIN AND COPPER.

**SIR.**—The remedy for this evil, which is afflicting the population of the mining districts of Cornwall with misery, ruin, and starvation, is simple and easy. Put a heavy duty, (say) 20 per ton upon Dutch tin, and a proportionately heavy duty upon imported copper ores, and prosperity would soon revisit the mining districts in question, at present desolated by the "blessings" of indiscriminate free trade, which the short-sighted policy of its advocates has introduced. The policy is this:—The foreigner, with natural advantages greater than ours, is invited to come in and undersell us, and this he has done, and is doing, to that extent that the industrial population of a whole country are being driven into exile, as they only escape from starvation at home, and the skilled labour thus expelled from our shores goes to develop the already overwhelming productiveness of foreign mines. In short, when England has driven its skilled operatives to every quarter of the globe to seek the means of subsistence denied to them at home, she may find too late that she has thus made all the world as wise, and as full of resource as she is now herself, and then the world will do without her. As far as the United States are concerned, this era is rapidly approaching. England's skilled workmen are her truest source of wealth, and whoever obtains them will not long need to be aided by her exports. Her political economists, no doubt, will say, never mind ruining a country or so if we only benefit the mass of the population. That is, starve and expatriate the poor Cornish miners, in order that the community may have their tin and copper at a minimum cost. Were this profound principle fully carried out, it is hard to say what might be the ultimate results.—July 31.

R. MUSHET.

#### INVENTIONS, AND OBSTRUCTIVE PATENTS.

**SIR.**—My friend, "Colliery Engineer," is again inaccurate in his statements. I remarked that one of my process, in conjunction with Mr. Bessemer's pneumatic process, would enable the Bessemer Company to secure royalties to the amount of 200,000, for the "present year." But "Colliery Engineer" alters my statement, and distorts it to mean 200,000 per annum. Next, he intimates that when he spoke of my iron patents he meant my Bessemer steel patents; but here, again, he blunders, for most of my patents refer to steel melted in crucibles, and not to Bessemer steel. Again, though he said my patents related to iron, he now affirms that they related to something which is agreed upon is not steel, but iron, and he then defines this kind of iron as a highly refined pig-iron with some of the properties of steel. This is a most novel and singular definition.

I am free to admit that men who never had an original idea do, indeed, often reap fortunes from the patented processes of inventors, who themselves have had their labours for their pains; but there are exceptions, and the most remarkable exception at the present day is Mr. Bessemer, whose success has been as great as is his invention.

If, however, "Colliery Engineer" can prove his first rule to be invariable, then I, with justice, claim to be a great and original inventor, for though I have enabled many, through my inventions, to realise fortunes, I have myself reaped nothing but hard work, anxiety, and disappointment. The railway interest, present and future, will owe me a large debt of obligation for having enabled them, through my spiegelstein process, to lay down steel rails, rendered malleable and durable, by the addition of spiegelstein to Bessemer metal, in place of the too often to be replaced iron rails which form the present staple of the permanent way, so called *Lucus non lucendo*, which so fearfully curtails the dividends on railway stock. Most likely the railway interest will, like Mr. Witte, "continue to owe this debt of obligation;" but it is, and will be, none the less due to me for my invention, and, perhaps, some day, when dividends increase, they will remember the obstructive patentee, who, with Mr. Bessemer, has given them durable steel, on whom he has heaped a sort of Pelion and Ossa of sarcasm, which they, indeed, must be tight 'uns if they did not groan under.

And, now, as to the billion blunder, why was it made in numerals, and clenched, as it were, by the confirmatory verbal statement? The clerical error seems nearly as large as the deposit of coal. But wonder of wonders, "Colliery Engineer" tells us that if 150 million tons of coal is the quantity actually indicated, it would show the seams in round numbers to average 20 ft. in thickness—that is, an average thickness of 20 ft. for each seam; and this, says he, is not an unheard of thickness in other collieries. Banish your fears, ye anxious-minded advocates for posterity! "Colliery Engineer" has collieries for posterity enough, and more than enough, and the seams thereof average 20 ft. in thickness. This, fortunately for posterity, is no clerical error. Happy thought, fortunate posterity, our greatest possible grand-children will yet be able to have a bit of fire to warm their toes at.

R. MUSHET.

#### BORING-MACHINES—ECONOMY IN MINING.

**SIR.**—Having had much experience in carrying on operations in rock, under the worst circumstances, I have been led to consider if anything could be done to lessen the expense of excavating therein. There are different ways wherein improvements may probably be made—among others, that of using stronger combustible material in blasting than the ones now generally used. The difference between the execution performed by best gunpowder and the ordinary powder used is very great in favour of the former, the quantity of rock displaced being far greater for the same cost; similar results may be obtained by the use of other descriptions of combustible materials. In the introduction, however, of stronger combustible material for blasting purposes a very important question has to be attended to—it's relative safety to life and limb as compared to the blasting material now in general use. Comparatively few of the accidents that now take place are through blasting, yet they are, unfortunately, too numerous, and, unless any explosively stronger materials are rendered equally safe as that now in general use, it would not be justifiable to introduce them, on that ground alone. Another, and by far the most important view of the subject, is to multiply

blasts by combustible materials that are comparatively safe. The greater number of advantageously explosive deposits that can be done by manual labour is being achieved, and it, therefore, follows if that number is increased it must be done by mechanical power. The simple question, then, is—*Can machines be successfully brought to bear underground for the purpose of multiplying the number of blasts, so as to hasten the extension of operations, and thereby lessen the cost?*

Having for several years considered the ponderous difficulties that lie in the way of successfully introducing machinery underground, in metallic mines, and given much study to the nature and construction of the machines required to answer the end, I not only come to the conclusion that machines can be successfully brought to bear to bore holes, but that they certainly will be, and that, too, in such an effectual manner as to enable adventurers to reduce the cost of working the majority of mines to the extent of some 40 or 50 per cent.; notwithstanding, I am fully aware of the fact that mine adventurers and agents take a very sceptical view of the matter at present. There are no arguments whatever required to convince those interested in metallic mining that they must raise minerals at far less cost to pay a fair interest on the capital employed, particularly at the present prices; and whatever the prejudice may be at present against the introduction of boring-machines, if it can be fairly shown that machines can be brought to bear so as to effect a tangible saving, that prejudice will vanish.

Wenford, Bodmin, July 30.

GEORGE RICKARD.

#### MONTES AUREOS (BRAZILIAN) GOLD MINING COMPANY.

"AUDI ET ALTERAM PARTEM."

**SIR.**—Having only lately become aware of the superabundance of abuse and blame that has been showered upon me on occasions when I could not defend myself, face to face against my accusers, I beg to remark, for the present, that I trust most of my accusers, on conscientiously and honestly examining the grounds of their accusations, will find that they have not dealt fairly by me—that they have been misled. Not even now can I find that the essential statements made in my original report were not true; what I called samples were really *bona fide* samples—the greater bulk of which gave only traces of gold, others yielding 0.25 oz., 0.25 oz. gold per ton of ore: none yielded more than that.

I have had to form a large establishment in a wilderness far inland, utterly destitute of all resources, surrounded and attended in every respect with unprecedented difficulties, scarcity of labour, &c. I have conscientiously worked hard and risked much, and the establishment as it now stands may bear testimony to the soundness or otherwise of my "theories and fancies." (Vide Capt. Martin's letter in the Journal of Feb. 24.) Certainly a great deal of our working forces and energies had to be unavoidably diverted towards repairing and strengthening the dams of Capt. Martin's large reservoirs, which were rather shaky, on account of having been constructed *minus a foundation*, not to mention the, perhaps, excusable absence of puddle-walls. The old water-stamps, erected by the former "practical" management, condemned themselves by being choked in their own waste sand, owing to their being placed too low, in the very bottom of the valley, with hardly any fall for water and sand. They can only be made to work permanently by separating the stamp-axe from the water-wheel axle, and connecting them by means of tooth-wheels, or other gear, thus bringing the stamp some 8 ft. higher than they now are. Instead of the old hovels erected by the former company, we erected dwellings on carefully-selected sites, so as to insure the best sanitary condition. (Vide, first medical report.)

The rate of deaths under former management was, I understand, about 10 per cent.; under mine it was scarcely 1 per cent. With an agonising scarcity of working force, a port had to be opened, a river cleared for many leagues, a cart road made more than 20 miles long, through a dense virgin forest of hard trees, with numerous bridges, in order to convey to the spot the heavy machinery, a great part of which is now erected and working at Montes Aureos. The Mocambicos, or bush negroes, who haunted the neighbourhood, I turned, after some accidental personal encounters, from a source of insecurity and danger into a source of labour for us. And during all the time I was there I managed to prevent the poor fugitive slaves from being hunted down and shot like wild beasts, as they were under the old management.

Besides having to found a large extensive establishment, such as it now stands, we managed to extract in three years, from very poor stuff, about as much gold as Captain Martin, who had the pick of the ground, managed to do with a numerically larger force of hands, in a greater number of years. At any rate, Capt. Martin ought to have made himself first better acquainted with the works carried out under my "gross mismanagement" at Montes Aureos and vicinity, before calling my plans "theoretical" and "fanciful" and the fact that I had not immediate success in creating a paying establishment, in a district where, for thousands of miles around, no other mine establishment exists, and that a premature exhaustion of the company's capital caused the collapse of the concern, does not justify Capt. Martin to join the throng of my inconsiderate and rashly-judging accusers, especially as in my non-success I have not the soothing consolation of having derived personal pecuniary advantages for myself. I had nothing whatever to do with financial arrangements in connection with the Montes Aureos Brazilian Gold Mining Company, beyond refusing a bribe, which some dishonourable members of the Brazilian vendors offered me for the purpose of inducing me to recommend an additional expenditure of the company's capital; and I have no doubt but that those individuals have not left a stone unturned to influence against me whomsoever they could impose upon. I certainly was unable to impart a higher percentage to the mass of stuff we have at first to work upon. I fully agree with Captain Martin that the concern should not be rashly abandoned without further trial, but the ground should be more explored at surface and in depth; several pits should be sunk; cross-cuts made in search of pyrite beds, of the existence of which we find strong indications in several spots; and I may here record my opinion that some such beds will be hit upon at no great distance from the first pit, which was commenced under my management, and under Captain Leach's, and subsequently Captain Roberts's immediate superintendence. I ask no favour, I ask only fair-play and justice.

London, July 28.

GUSTAV JULIUS GUNTHER.

#### DYFNGWM MINE, AND ITS MANAGEMENT.

**SIR.**—In your Notices to Correspondents there are almost weekly allusions made to Dyfngwm Mine, and also mention made of, and remarks on, a printed letter by an "Ex Officio." On the face of your own remarks I presume you have perused that letter.—



ore was being obtained than at lesser depths: he mentioned that more particularly because there had been more or less doubt among scientific men as to whether quartz would hold in depth, but here there was a practical result.

The motion being put, was carried unanimously. A vote of thanks was passed to the Chairman and directors, which terminated the proceedings.

#### CONSOLIDATED COPPER MINES OF COBRE ASSOCIATION.

The half-yearly general meeting of shareholders was held at the offices, Gresham House, on Tuesday,

Mr. HENRY R. GRENFELL, M.P., in the chair.

The notice convening the meeting, the report of the directors, and that of Mr. Petherick having been read (which appear in our advertising columns),

The CHAIRMAN said those shareholders who were present at the last meeting would remember that he, on the part of the directors, indicated that unless the expenditure at the mines was reduced, and the price of copper somewhat improved, a special general meeting would have to be shortly convened for the purpose of either altering the constitution of the company, or raising fresh capital to pay off the balance which, as shown in the accounts, was against them. Therefore, shareholders would not be surprised to find that after the business of the ordinary meeting a special meeting was to be held for the purpose of taking those questions into consideration. It had, no doubt, been observed that upon the present occasion the accounts submitted were in a somewhat different form to that hitherto followed. The first, showing the receipts and disbursements, was the same; but the second—the capital account and balance-sheet—had been made out, because the directors were about to ask the shareholders' consent to an increase of capital. As an account, however, it was of little importance, because the capital—140,000—was, in fact, the purchase-money paid for the mine, from which time no capital account had been kept, the expenditure having been charged against revenue. The third account—the estimated receipts and disbursements for the five months ending May 31—was presented to show the present financial condition of the company, and also the absolute necessity of raising fresh capital. Although the produce had upon previous occasions been fairly valued as against the estimated disbursements, yet it was found by experience that such estimates were very often fallacious, and led to misconception on the part of the shareholders. The ad-views received by the West India mail yesterday gave the estimated results of June, which did not differ from those of the previous five months, consequently the account of estimated receipts and disbursements might be accepted as something like correct, the balance against them being about 47,000; therefore, it was quite clear that the important point to be decided to-day was as to whether it was worth while to continue to work the mines, and if so, to determine as to the best means to adopt to raise the necessary capital. Shareholders were aware that mining in every part of the world was just now very much depressed, owing to the low price of metals—he believed the mines in Chile the most prolific, perhaps, in the world, were not now paying their expenses. But it was not to be supposed that the present depressed price would continue, but that, with cheaper money, copper would command an improved price. The question to be considered really turned upon the point referred to in the last paragraph in Mr. Petherick's report, in which he strongly urges that until a satisfactory arrangement for a reduction of the present enormous railway charges, or the transit of the ores, and of the materials required for the use of the mines, shall be come to, all expenditure on works of a purely speculative or unproductive character should be avoided; and that the working expenses should be confined, as far as may be practicable, to the further exploration of the productive portions of the lodes, and to the extraction of the ores already discovered. The directors of that railway in Cuba, seeing that by persisting in their present course they were likely to kill the goose that produces the golden eggs, had sent over the report of an extraordinary general meeting to take the subject into consideration. The falling off in the returns was (as stated in the report of Mr. Petherick) "due to the neglected state of the old mine, Ysabelita, and to the partial suspension of the underground operations there, in consequence of the defective state of Ellice's pumping-engine. A considerable extent, therefore, of productive ground, discovered and partially laid open previous to his visit of inspection in 1863, still remained unexplored, and available for future returns in the bottom levels of this mine; and taking into account the subsequent discovery of the north lode in the great mine, which had hitherto yielded considerable returns, and still continue very productive, it appeared to him that the mines, on the whole, were at present in a more productive state than they were three years since, when the monthly returns from the old mine exclusively were estimated at 1120 tons of dressed ores per month." The directors, he might add, had not for some time past been altogether satisfied with the manner in which the mine had been carried out, but as far as the mine itself was concerned, the directors believed that it was as valuable as when Mr. Petherick inspected it three years since, that the smelting-works were in a good state, and that the plant, and everything for making the property valuable, were in a condition equal to what they were at any time previously. He concluded by moving that the report and accounts be received and adopted.—Mr. WALTER SHARP seconded the proposition.

Mr. PETHERICK, replying to questions, stated that the smelting works were more than equal to the treating the estimated 400 to 500 tons per month. He considered that that quantity ought to pay the expenses, even at the present price of 13s. per unit. He wished it to be distinctly understood that his report was hypothetical, for he had not visited the property for three years. It was based upon the paper relating to it that had been placed before him. He thought that a part of the old mine had certainly been neglected, or much larger returns than he had estimated. In his former report would have been referred, since other discoveries had been made. He would also say that the measures he recommended had not been carried out, and that he could not be held responsible for the result of the operations unless these measures were carried into effect; indeed, he would go further, and say that he believed the present position of the company was mainly owing to the neglect of those measures. As regards the new mine, he had never inspected the underground works, but he never attached so much importance to the discoveries there made as to divert attention from the old mine. One great source of the falling off in the value of the returns had been that the smelting-works, from which he calculated an average profit of 30s. to 35s. per ton, had not been kept in operation, from a cause which it was not his duty to refer to. He contended that the smelting-works should be made available for the maximum return, and he certainly thought some explanation should be given as to the reason why it had not been done.—After some further discussion, the motion adopting the report and accounts was put and carried unanimously.

A special general meeting was then held,—Mr. HENRY R. GREN-

FELL, M.P., in the chair.

The CHAIRMAN said the object of this meeting was to submit resolutions having for their object the raising of additional capital, which it was proposed to do by altering the present shares of 40s. to 50s. each. Of course the primary object was to pay off the present liabilities, after which it would be easy enough to obtain financial assistance—if it should be required—the creditors of the company knowing that there was an adequate uncalled-up capital. It was also proposed that the company should be registered with limited liability, Mr. UPTON (the solicitor) explaining the legal bearing of the resolutions, and stated that they had been drawn up under the advice of Mr. Butler, the eminent counsel.—A long discussion ensued, during which an amendment was proposed by Mr. CONYBEARE, and seconded by Mr. DUNOON, that a committee of shareholders be appointed to investigate the state of affairs, as to the best mode to deal with the existing circumstances, and also to confer with the directors and to report to an adjourned meeting.—The amendment was lost, when the proposition was put and carried. A confirmatory meeting will be held on Aug. 21.

A vote of thanks to the Chairman and directors terminated the proceedings.

#### LONDON AND COUNTY BANKING COMPANY.

The half-yearly meeting of shareholders was held at the London Tavern, on Thursday,—Mr. W. NICOL in the chair.

Mr. CLAPPISON (the secretary) read the notice convening the meeting. The report of the directors appears in our advertising columns.

The CHAIRMAN, in moving its adoption, stated that since the last meeting banking institutions had passed under a most perilous ordeal, and, therefore, it afforded the directors great pleasure to have an opportunity to submit to their constituency a faithful statement of the present position of the London and County Bank, by which it would be seen that it had stood its ground. He congratulated the shareholders upon the fact that, although, in common with other banks, the London and County had been unscrupulously assailed, it had not shared the common fate, theirs being out of the great number so assailed the only one that had successfully withstood the shock. (Hear, hear.) It had been pretty freely reported that members of the Stock Exchange were the authors of these unscrupulous attacks, which had brought about the late severe financial panic; but, for the honour of the Stock Exchange, he felt bound to state that not one of the properly accredited members had taken any part in the bringing about such a dire calamity: it was entirely effected by "outsiders," with the assistance of their abettors inside, who were very few in number, and even those could have scarcely realised what was ultimately accomplished, or they would never have countenanced or supported such nefarious proceedings. As he had already said, the figures presented in the balance-sheet showed the real position of the bank on June 30, 1866, but no figures could adequately represent the amount of malevolence that had been brought to bear upon the bank by "the bears." Those animals, not content with spreading false and malicious reports with regard to the bank, went into hotels, taverns, railway carriages, and other places, speaking loudly and falsely of the position of the bank, affirming that its doom would be closed the next day. To crown their diabolical proceedings, they positively sent circulars to the country shareholders, proffering the following advice:—"Sell out your shares at once, or you will be ruined!—A Sincere Friend." The effect was that some accounts were withdrawn, but then and throughout the panic every demand upon the bank was promptly met. (Hear, hear.) The result was that, although the directors met the proprietors with smaller balances, the reserve fund and capital were intact, and the credit of the bank was undiminished. (Hear, hear.) He (the Chairman) then proceeded to compare the various items in the present balance-sheet with those read at the previous meeting, stating that notwithstanding the diminution in customers' balances as compared with the amount at the meeting six months since (which he stated at the time was exceptional), they now stood at about the same as at this time last year. (Hear, hear.) Under all the circumstances it was wonderful that the bank had suffered so little, and he was happy to say that money was rapidly coming back, that the customers' balances had increased 350,000, since July 1, and that during the last fortnight no less than 1049 new accounts had been opened, the total number now being 48,680. (Hear, hear.) He concluded by moving that the report and balance-sheet be received and adopted.

Mr. CHAMPION JONES seconded the proposition, which was put and carried unanimously, without one enquiry being made.

The CHAIRMAN said he need hardly remark that it was the great desire of the directors to see the business of the bank steadily increase, but they thought it right that the share capital should bear some proportion to the increase of the business. The Deed of Settlement at present shows that the directors should issue 40,000 shares of 50s. each, but of that number only 37,500 had been issued. It was proposed to extend the power to 60,000 shares, not that those shares would be immediately issued, but it was thought desirable the power should exist. The proposal, therefore, was that the capital of the bank be increased by the issue

of 20,000 additional shares of 50s. each.—Mr. P. P. BLYTH seconded the proposition, which was put and carried unanimously.

A unanimous vote of thanks was passed to the manager, secretary, and the officers of the bank for the efficient manner in which they continue to discharge their respective duties.

Mr. M'KEWAN (the manager) on rising to respond to the vote, was received with the greatest enthusiasm. Having appropriately acknowledged the vote, he said that he could not allow the present opportunity to pass without referring to some extent to the anxious period through which the Bank had recently passed. (Hear, hear.) During that period there had occurred events in the financial and commercial world more memorable than within the memory of any living man. Only those who happened to be in the centre of the agitation in May last could form any idea of the anxious feelings then prevalent, which was intensified by mobs of curious people, who were scattered about the City, and sensational articles in the newspapers. There was a strong feeling that commercial London was in a state of commercial siege; and it certainly was not to the good feeling of certain parties towards the London and County Bank that the shareholders were to attribute another meeting being held to-day. He would guard himself from mixing up members of the Stock Exchange with that class of persons who speculate in the shares of financial companies and banks, for the respectable members of the Stock Exchange, as a body, he believed, strongly reproved such proceedings, which, he understood, was imported from America. These people, most of whom were "outsiders," were not satisfied with what they termed "bearing" the shares, but had recourse to a system most diabolical and nefarious. On June 14, he believed, 500 shareholders received letters recommending them to sell their shares, knowing that if they could induce them to do so those men who had speculatively sold a larger number of shares than they could deliver would be able to buy back at lower quotations. But they did not succeed, owing to the firmness of the great body of shareholders. The share register showed that the sellers were mostly those who had recently invested in the shares, and the great bulk of the shareholders were those who had no fear in February next the directors would render even a better account than they had done to-day. (Hear, hear.)

A vote of thanks to the Chairman and directors terminated the proceedings.

#### GALE'S PROTECTED GUNPOWDER COMPANY.

The first ordinary general meeting of shareholders was held at the Westminster Palace Hotel, on Monday,

The Hon. H. W. PETRE in the chair.

Mr. DAVID KER (the secretary) having read the notice convening the meeting, and the minutes of the last, the subjoined report of the directors was submitted:

Since the two meetings of shareholders, held in March last, the directors have been actively engaged in making arrangements for carrying on the business of the company in accordance with the opinion then expressed. After a good deal of consideration, they found it desirable to erect crushing machinery at Bristol, for the purpose of preparing the protecting material. These works are now nearly completed, and in a few days will be in operation. The successful result of the Government experiments at the Pet Tower, near Hastings, has been made known through the public press. The result confirms the assurance which the directors have always felt, that the more fully Mr. Gale's invention was tested the more evident would its value become. It is satisfactory to find that the machinery arranged for mixing and used on this occasion, was entirely suitable, it being both convenient in working and perfectly regular in its results. Owing to the non-payment by Mr. Rendle of sums due from him on his shares, it became necessary for the company to take proceedings against him. In answer to this action, Mr. Rendle pleaded fraud and misrepresentation on the part of the company, but a few days before the trial he withdrew the plea, and consented to judgment being signed against him. Mr. Rendle thus had an opportunity of establishing the truth of his charges, but failed to do so. With reference to the circular published by Mr. Howard, and the articles which have appeared in the *Western Daily Mercury*, the statements they contain are so manifestly untrue and injurious to this company that the directors have taken proceedings against the publishers for libel. In consequence of the extreme tightness of the money market the directors have been careful in incurring expenditure. The total outlay up to June 30, exclusive of payments to the patentees, amounts to the sum of 1402, 17s. 11d., and the liabilities in addition to these payments incurred up to the present time do not exceed 1500. The time, however, has now arrived when a larger outlay will be necessary in order to carry on the business of the company, and it is therefore essential that the call due on August 1 be promptly paid. As the arrangements for the preparation of the protecting powder have been made on a much more economical scale than was originally supposed possible, the directors are of opinion that if that call be promptly paid it will not be necessary to make any further call until the business of the company is successfully established, and Justifies extended operations. Sir John C. D. Hay, Bart., has retired from the directorship, in accordance with the Articles of Association, and in consequence of other duties does not offer himself for re-election.

Mr. EDWIN HOWARD (of 66, Paternoster-row), in reply to the Chairman's challenge, stated that he was not a shareholder, but that he appeared there as the professional representative of holders of 1400 shares, and he believed a dozen instances had occurred within the past 12 months in the City of London where solicitors had attended in the same way, and no objection had been raised.—Mr. PEAD (of Marchant and Pead), the solicitor of the company, remarked that the presence of a solicitor was not objected to, provided any question he might have to ask were put through a shareholder.—Mr. HOWARD then presented a transfer for one share, and therupon claimed the right to speak, enquiring at the same time whether it was the intention of the board to court investigation, or to Burke discussion.—Mr. PEAD said that the transfer was useless until registered, and the transfer books at present closed the registration could not now be effected.—Mr. RENDLE complained that the notice given of the meeting was so short that it was impossible to register it in time.—Mr. PEAD denied this. The notices were sent out on July 21 for the meeting to be held on July 30, so that the time was ample.

Mr. HOWARD said he represented a number of persons who had put their money into the company, and he had no questions to ask except to the interest of the whole company.—Mr. PEAD persisted that the questions must be put through a shareholder. The directors would, he was sure, give every information in their power, and would take no unfair advantages of technicalities. There was no intention to act on the power contained in the Articles, by which shareholders who had not paid their calls were to be excluded. The object of the Chairman would be to answer all questions put by shareholders.—Mr. RENDLE claimed that he represented three-fourths of the *bona fide* shareholders in the company, and after a great deal of personal discussion the Chairman rose to move the adoption of the report, Mr. Howard most perseveringly persisting in addressing the meeting throughout.

The CHAIRMAN said that on May 4 last there appeared a letter in the *Western Daily Mercury* from Mr. Howard, and that letter had been the cause of an action which was not yet decided. The first question raised was as to whether Mr. Gale was the first inventor of the process; he considered there were no grounds for the objection. Another statement was that the Government refused to have anything to do with the process. That this was not the fact was well known. He had received a letter from General Lefroy, in which he stated that no report had been made on the experiments of June 20, and that the result could not be communicated to private individuals, but could only be obtained from the War Office. As to the gunpowder manufacturers being opposed to the invention, he need only say that there was one manufacturer who declared that it was a very good invention whilst he wanted to sell his powder mills to the company, but as soon as he found that the sale was not likely to be effected by the described invention as all bush. There were also other shareholders, to the effect that money payments or presents had been given to the directors, and that they were the mere nominal holders of their shares. As to Col. Ryley's invention, it was not the same as Mr. Gale's. Col. Ryley claimed a bone-ash only, whilst Mr. Gale's invention was for the use of fine, dry, and combustible powder. It had been a subject of regret to the board that whilst they were doing their best for the shareholders any person who had been friendly to the company should think it advisable to take such an extraordinary mode of proceeding as that adopted by the gentleman referred to in the report. The result was that injury must be done to their property. The directors had hoped before now to have answered all the allegations which had been made, and that they would have been sifted, but these would be made apparent in a court of law. If the objections had been brought forward at the March meeting, they would all have been then answered. The directors had been disappointed in not having the entire matter discussed at the hearing of the action against Mr. Rendle; and the *Western Daily Mercury* action was likewise delayed, by the appointment of a commission to get evidence from the Continent. He concluded by moving the reception and adoption of the report.

Sir ARTHUR BUTLER, M.P., seconded the motion. There was one point in the communication of Mr. Howard which the Chairman had touched very lightly upon, and he would, therefore, ask Mr. Rendle distinctly to state what was the meaning of the charge that money presents and payments had been made to the directors, and that they were the mere nominal holders of their shares? Mr. RENDLE expressed his readiness to produce documentary evidence that the two clauses were correct, and suggested that this should suffice; but upon being closely pressed by Sir Arthur Butler, Col. de Bathe, and other members of the board to state whatever in his discretion he thought fit, he stated that the allusion referred to the directors' qualifications; that Sir John Dalrymple Hay, Bart., Sir Arthur W. Butler, M.P., and Mr. John Gilbert Talbot were the directors whose qualifications were given to them.

Sir ARTHUR BUTLER expressed his satisfaction that those were the sole presents referred to, and Mr. TALBOT observed that he was told that if he felt inclined to join the board his qualification would be provided by Mr. Rendle; all he had received, however, was a large number of shares, upon which there was a large liability.—Mr. PEAD explained that Mr. Rendle was the promoter of this company, and that Sir John Hay said that he was so fully occupied that he was unable to join the board, and it was then, by Mr. Rendle's express influence, that he told him Mr. Rendle would provide the qualification.

Sir ARTHUR BUTLER believed there was nothing unusual in the qualifications being given to directors, and he wished to state how he came to be induced to become a director of the company. He had at first declined, but he received a letter from Mr. Rendle, telling him that there was 10000 per year for directors, and an additional 1000, when the profits exceeded a certain amount. He believed there was nothing unusual in directors accepting a qualification, and he would have said nothing of the matter but that he thought many had, no doubt been induced by what had been published to believe that they had been guilty of receiving undue and unusual consideration. If Mr. Rendle admitted that he had only referred to the qualifications given to the directors he was quite satisfied.—Mr. HUGGINS (of Huggins and Rowsell) wished to explain, with regard to the conduct of his firm in the matter, that Mr. Rendle came to him and said that he had become acquainted with a discovery, and he (Mr. Huggins) had yet to learn that it was not a great discovery, and entered upon negotiations with them. The negotiations by Mr. Rendle went on, and all communications from Mr. Rendle were of the most sanguine character. Mr. Rendle brought to him the report of Mr. Bidder, and he placed implicit reliance on that document. He was surprised, however, to learn that Mr. Rendle was opposing the granting of a

settlement by the Stock Exchange. He (Mr. Huggins), however, succeeded in getting the committee to postpone the question, that the secretary and the directors, as well as Mr. Rendle, might be before them; and at the adjournment Mr. Rendle failed to satisfy the committee as to the justice of his case, and the settlement was granted; and he must say that no board ever acted more conscientiously.—Mr. RENDLE admitted Mr. Huggins's facts, but maintained that altered circumstances had led him to alter his opinion. He concluded a long speech, a great portion of the time of delivery being occupied by the frequent repetition of the assertion that it would be a long speech, with an amendment to the effect that a committee of five or seven shareholders be appointed to communicate with some eminent professors, such as Faraday, in order to ascertain the merits of Mr. Gale's discovery, and to report the result of their investigation to a future meeting.—A SHAREHOLDER observed that Mr. Rendle had come forward to make personal explanations, and had made many instigations which, when explained, seemed scarcely justified, and he would like Mr. Rendle to explain whether any such collision would have taken place if great money difficulties between himself and the inventors had not arisen. He suggested that a Bill in Chancery would not entail as much expense on the shareholders as the loss by the present system of opposition; and he remarked that if one-tenth part of his statements were proved the shareholders would be relieved from their responsibilities to the company, and could demand a return of their payments. But all these questions could be tried by a proper tribunal.

Mr. SAUNDERS, the manager, said, with reference to the statement that the protecting material could not be obtained at the price of 20s. per ton, that they had obtained the opinion of Mr. Siemens, C.E., and he estimated that they could obtain it at 12s. per ton on the banks of the Thames, and 9s. per ton where coal was cheap. He considered that there was an essential difference between the inventions of Col. Ryley and Mr. Gale, but even if the inventions were identical Col. Ryley did not go to the public and the Patent Office, and Mr. Gale did both, so that Mr. Gale's rights could not be affected. (Mr. PEAD, the solicitor, supported these views.) He considered it important that Mr. Rendle's position should be well understood; that gentleman applied to Mr. Gale and offered to form a company, and had become, in fact, the promoter (Messrs. Marchant and Pead were Mr. Rendle's solicitors), and it was by Mr. Rendle that Messrs. Saunders and Gale were introduced to them, so that his present opposition was unjustifiable. With regard to Mr. Etheridge's connection with the company, he might say that Mr. Etheridge was well known in connection with the Museum of Practical Geology, and was in negotiation for accepting office under the company, but those negotiations were subsequently broken off. The delay, of which Mr. Rendle was the principal cause, had resulted in one good effect; they had found that they could erect works at Bristol more cheaply than on the Thames, and those works would be completed this week. So far as the opposition of the gunpowder manufacturers was concerned, they were not likely to encounter it, as the company would purchase their powder, mix it with the protecting material, and by the arrangements they had entered into they would be able to sell the protected powder at the price of unprotected.

The CHAIRMAN said that so far from Mr. Etheridge disconnecting himself with the company because he ceased to have a good opinion of it, Mr. Etheridge was exceedingly anxious to take office, but was subsequently dissuaded from other reasons.—Mr. Rendle's motion was then put and negatived, and the report and accounts were received and adopted. A vote of thanks to the Chairman terminated the proceedings.

#### TRUTH'S ECHOES, OR SAYINGS AND DOINGS IN MINING.

The Mining Share Market continues in a very inactive state, and but little business appears to have been transacted during the week. The usual fortnightly settlement took place on Tuesday, which made but little or no difference in share-dealing, nor can any manifest change be anticipated before an improvement in the metal market, which appears to be in the same dormant state as for some time past. WHEAL SETONS have been more freely offered, and buyers scarce. WEST SETONS remain almost unnoticed. CLIFFORDS have been introduced at lower rates, and no dealers. EAST BASSETTS have receded, and freely offered. EAST CARN BREA have been rather

## Mining Correspondence.

## BRITISH MINES.

**BOTTLE HILL.**—J. Eddy, Aug. 2: Friday last being one setting-day, the following bargains were let:—A stope in the back of the 17, west of the western shaft, to four men; the lode is 6 ft. wide, and worth about 41, per fm.; stopping for 35s. per fm. A stope east of Williams's shaft, to four men, at 30s. per fm., where the lode is about 5 ft. wide, and worth about 41, per fm.—**Tribute:** A pitch east of new shaft, in back of the 12, to four men, at 12s. 6d. in 12. tribute. Also a pitch west of new shaft, in back of the 24, to four men, at 12s. 6d. in 12. tribute. All the landing from the different shafts in the mine for one month, at 3s. 6d. per 100 kibbles. Also the kibble filling for one month, at 1s. 2d. per solid fm. I hope to commence burning for our next sampling the early part of the coming week.

**BRONFLYD UNITED.**—T. Kemp, Aug. 1: The part of lode carried in the 52 west continues poor as far as proved, and I have now brought the men back to strip down the lode standing along this drivage; this is set to two men, at 7s. per fm. The stope east and west of the winze, in the back of this level, to 12 men, at 37s. 6d. and 50s. respectively. The men in the new shaft are cutting pitch, &c., in preparation for sinking the shaft another stage.

**BRYN GWYN.**—H. Nottingham, Aug. 1: There is no alteration in the south-west level from middle or incline; the other north and south joint we are now driving on, south from the above level, has rather improved for lead. The sums sinking in the lower level, south-west of incline, are yielding small lumps of ore, but not enough to value. The stope along the back of Clark's level are not looking so well for lead, and the ground has become harder. The cross-cut we have been driving north-west from No. 2 level, north of incline, has crossed the joint we have been driving for, and we have sunk about 1 fathom on the joint, but found it unproductive; I intend removing these men to some other part, not yet decided on. At the last setting-day I removed the tributaries from the south level, every place being unproductive, and set them a bargain in Field's level, south of rise, and they have since found a narrow joint of lead running under the old workings, which may continue awhile, and be of value. Having had some heavy rains lately, we are now commencing our dressing operations, having a supply of water without pumping.

**CAPE CORNWALL.**—R. P. Goldsworthy, Aug. 1: The lode in the 90 end west is of a very promising character; ground soft, driving at 45s. per fm. The lode in the so winze west retains its size and value fully. Our tributaries are getting fair wages.

**CARADON AND PHENIX CONSOLS.**—Wm. Richards, Aug. 1: The engine-shaft is sinking by a full pair of nine men below the 40, on the course of No. 1 lode; the ground in the deepest point reached is stiff granite, which impedes the progress; it is, however, mineralised by small bunches of fluor-spur, mundic, and yellow copper ore. The lode at this time is smaller, owing to the tightness of the ground; it is about 2 ft. wide, and contains quartz, peach, prian, mundic, and a little copper ore. The new machinery continues to work well.

**CARADON CONSOLS.**—S. Bennetts, July 31: The lode in the so east end is 3 feet wide, of a very promising character, and producing some good ore, and from its appearance I think there is a better lode near this end than is at present laid open. In the west end the lode is 1 1/2 foot wide, still disordered, and not so dry as last reported. The rise above the so, and the winze below the 54, are within about 12 fm. of each other, and we hope to complete the sinking and raising of this in the course of a week.

**CASHWELL.**—J. Peart, July 31: The stope in Scar limestone are much the same. The vein in the low drift below the Scar limestone continues to improve, and is yielding some good pieces of ore. The stope in the Slaty hazel are worth 1 ton of ore per fm. We have sold 40 tons to Messrs. Lecke, Blackett, and Co., for 13s. 11s. 3d. per ton.

**CASTELL CYN DODCHAN (Gold).**—J. Parry, Aug. 1: We have set the raising of the stuff, including its delivery on the dressing-floor by tramway, at the rate of 6s. 6d. a ton for this month; this price includes driving, sinking, and raising, besides stopping. The lode in the north-east driving from shaft is about 3 ft. wide, impregnated with iron pyrites. We have commenced sinking from the upper adit to the end of the present driving to lay out fresh stope. The lode in No. 3 stope continues about 6 ft. wide, yielding fair stamping stuff. In the smelting stope the lode is 3 to 4 ft. wide, yielding specks of gold now and then. The quantity of stuff stamped last month is 201 tons. Gold obtained from amalgamators to-day 8 ozs. 12 dwt. We have stopped the stamps to-day to clear the cofers and repair. We have now plenty of water, and shall start again on Friday.

**CENTRAL MINERA.**—T. Hughes, Aug. 2: Victoria Engine-shaft: The lode in the 60 yard east contains good stones of lead, and very promising for an improvement. The lode in the stope in the back of this level yields very good lead, and favourable for a continuation.

**CLARA UNITED.**—J. Davis, Aug. 1: Llywernog: Settings for August: The 50 west, to four men, at 14s. per fm. The stope in the back of this level, to four men, at 7s. per fm. Stope No. 2, in back of the same level, to two men, at 6s. per fm. The stope in back of the 40, to four men, at 7s. per fm. The winze under the 30, to two men, at 12s. per fm. The engine-shaft men are preparing to fix steeper, and to replace the present bottom lift, which is too small by a larger one.

**CORNISH CLAY AND TIN WORKS.**—W. H. Willcock, R. Sergeant, Aug. 2: We are still making satisfactory progress in our main adit level, having driven and secured 12 fms. since our last report. We have to-day commenced to sink a shaft upon the same for ventilation, and the drawing to surface the attie, which will enable us to continue the drivage, so as to get in upon the bed of clay more speedily.

**CRENVER WHEAL ABRAHAM.**—Wm. Kitto, Aug. 1: Referring to my last report, we sampled yesterday 143 tons (computed) of mundic; the sale fixed for Monday, the 13th inst. We weighed in last Monday 43 tons of tributaries' copper ore, making the quantity altogether 183 tons. We hope to put the plunger-lift to work next Saturday at the middle engine-shaft, which will be first-rate.

**CROWAN AND WENDRON.**—R. Reynolds, July 31: The engine-shaft is 4 ft. below the 60, and in one week from this time we shall be in a position to fix the bearers and cistern for the larger lift. The lode in the 60 west is about 2 feet wide, producing occasionally stones of grey and yellow copper. Fair progress is being made in the cross-cut south at the 60. In the 48 east we have opened a few feet south, and have discovered a piece of lode, 2 ft. wide, and it has more kindly appearance than anything yet seen in this level.

**CUDDRA.**—F. Puckey, A. Cundy, Aug. 1: We have commenced driving the 130 fm. level, west of Walker's shaft, by six men. In the killa by the side of the lode; the ground is favourable for progress; the present price for driving the end is 4s. 10s. per fathom. In the 117 end, driving west of Walker's shaft, the south part of the lode for 10 feet wide, is still worth 20s. per fathom. In driving the cross-cut north, it still being in the gossan, we have not yet reached the north lode. The different stope throughout the mine are without alteration; the lode is of the same size and value as stated in our last week's report.

**DALE.**—R. Niney, July 30: No. 2 stope are rather improved for lead, but is still greatly mixed with blonde. The other places are without alteration. We have just communicated from the bottom to the top carriage, which is looking very promising.

**DEVON AND CORNWALL UNITED.**—T. Neill, July 31: There is no change in the 24 fm. level cross-cut north.—William and Mary: The lode in the 34 east is worth 3 tons of ore per fathom. The lode in the winze is worth 6 tons. Two stope in the back of this level are worth 6 tons each per fathom, and altogether I think the ore is of better quality than the last.

**EAST CARADON.**—J. Truscott, Aug. 1: The caunter lode, in the 100 east and west, is producing stones of ore. The 90 west is yielding saving work. The 90 east is worth 25s. per fm.—South Lode: The 90 west is worth 10s. per fm.; the 90 east, 10s.; and the 70 east, 8s. per fm.—New Lode: The 70 east is worth 1s. 8d.; and the 70 west, 6s. per fm.

**EAST CARN BREA.**—J. Richards, Aug. 1: The lode in the winze sinking below the 70, west of old engine-shaft, is 4 ft. wide, and worth 2 tons of copper ore per fathom. The lode in Thomas's engine-shaft is 1 ft. wide, composed of quartz, capel, mundic, and good stones of copper ore.—Thomas's Engine-shaft: In the 70 east, on No. 3 lode, the lode is 1 ft. wide, and consists of quartz, mundic, and a small portion of copper ore. In the 69 east, on north part of No. 3 lode, the lode is 2 ft. wide, worth 2 tons of copper ore per fm. In the 69 east, on south part of No. 3 lode, the lode is poor; this drivage is for the present suspended to admit of a rise being put up in the back of this level. The lode in the 50 east is 1 ft. wide, consisting of capel, quartz, mundic, and produces occasionally stones of copper ore.—Buckley's shaft: The lode in the 60 east is 1 1/2 ft. wide, composed of capel, quartz, mundic, peach, and a little copper ore. The lode in the 60 west is 1 ft. wide, and is of the same general character as that in the eastern level. The lode in the 50 east is 1 ft. wide, and worth 1 ton of copper ore per fm. The lode in the rise in back of the 50 west is 1 ft. wide, and produces 1 ton of copper ore per fathom.

**EAST GREENVILLE.**—G. R. Odgers, W. Bennetts, Aug. 1: The lode in the 95 west is 18 in. wide, producing some good ore—a kindly lode. The lode in the 95 west is 18 in. wide, producing ore and tin, also a kindly lode. The stope and all other places are looking precisely the same as we stated on Saturday.

**EAST LAXEY.**—W. H. Rowe, Aug. 1: The engine-shaft is now down 17 fms. below adit; the lode is composed of a favourable killas, friable quartz, and a little iron pyrites. The adit end and north is now driven 35 fms. from shaft; the lode is nearly 4 ft. wide, of a promising nature, composed of compact killas and quartz, strongly bespangled with lead, blonde, and copper. A 20 fm. level from the engine-shaft northward, right through the successive bearing sections of ground already passed through by the adit, will, in my opinion, be highly judicious.

**EAST ROSEWARNE.**—John James, Aug. 2: At King's shaft, sinking below the 80, we are through the elvan course; the lode in the killas is 1 ft. wide, producing a little ore, but not to value. In the 80, east of King's shaft, the lode is unproductive. In the 80, west of King's, the lode is 14 in. wide, with more spar than usual; consequently, not quite so productive for copper, worth at present about 6s. per fathom. In the 80, west of Hallett's shaft, the lode is 1 ft. wide, producing stones of ore. The stope in back of the 80, west of Hallett's shaft, is worth 12s. per fathom. The stope in back of the 75, east of King's shaft, is worth 9s. per fathom. The two stope in back of the 75, west of King's shaft, are worth respectively 7s. and 9s. per fathom.

**EAST SNAEFELL.**—W. H. Rowe, Aug. 1: The foreheads at Glen Cherry shaft are still in a promising lode. The 90 north has rather improved. I hope to send you an estimate of the expense of wheel, &c., in a few days.

**EAST ST. JUST UNITED.**—John Carthew, P. Casley, Aug. 1: Our men are still cutting whin-plat in the 20, at Phillips's engine-shaft. We have sampled a good lot of tin from the winze below the 10, west of this shaft. At North Bosorne shaft the winze is sinking below the 20, and looking well for tin. The lode in the east end of the winze is from 2 1/2 to 3 feet wide, and all in whole the ground. At Wheal Venton shaft we have 12 miners, who are stopping below the deep adit level, east and west of this shaft; these stope are looking better for tin than last week. Our tributaries are working well.

**EAST WHEAL LOVELL.**—R. Quenat, Aug. 1: We have commenced driving west of new shaft, on north lode, 17 fms. below the 45, on a lode worth 30s. per fathom, or upwards. There is no alteration to notice in any other part of the mine since last week.

**EAST WHEAL RUSSELL.**—John Goldsworthy, July 30: The lode in the 140, east of Roberts's cross-cut, has an improved appearance; the ground is becoming easier. I am of opinion we shall soon see a good lode in this level. No other change.—P.S. The ore weighed on Friday last, computed 140 tons, weighed 146 tons 3 cwt.

—J. Goldsworthy, Aug. 1: Homersham's shaft is in regular course of sinking below the 140 fm. level. Fair progress is being made in the 140, driving east

of Roberts's cross-cut; the lode is 3 feet wide, composed of capel, quartz, prian, flookan, and produces grey sulphurite, black oxide, and yellow copper ore; the lode presents indications to warrant a speedy improvement with an increase of water. The stope in back of the 130, east of Barkell's rise, is worth 5s. per fm. The stope in back of the 130, west of Barkell's winze, is worth 12s. per fm. The stope in back of the 130, east or Barkell's winze, is worth 10s. per fm.

—James Richards, Aug. 2: Homersham's shaft, sinking below the 140, progresses favourably, and is in congenial ground for the production of mineral. In the 140 east, and east of Roberts's cross-cut, the lode is of good size, 3 feet wide, composed of quartz, capel, mundic, black oxide, grey sulphurite, and yellow copper ore, and is altogether very promising. The lode in the stope in the back of the 130, east of Barkell's rise, is worth 5s. per fm. In the stope in the back of the 130, west of Barkell's winze, the lode is worth 12s. per fm. The stope in back of the 130, east or Barkell's winze, is worth 10s. per fm.

—T. Kemp, Aug. 1: The part of lode carried in the 52 west continues poor as far as proved, and I have now brought the men back to strip down the lode standing along this drivage; this is set to two men, at 7s. per fm. The stope east and west of the winze, in the back of this level, to 12 men, at 37s. 6d. and 50s. respectively. The men in the new shaft are cutting pitch, &c., in preparation for sinking the shaft another stage.

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—J. Peart, July 31: The stope in Scar limestone are much the same. The vein in the low drift below the Scar limestone continues to improve, and is yielding some good pieces of ore. The stope in the Slaty hazel are worth 1 ton of ore per fm. We have sold 40 tons to Messrs. Lecke, Blackett, and Co., for 13s. 11s. 3d. per ton.

—GATWELL.

—R. Doidge, July 30: We have cleared the 40 a considerable distance beyond the point where the old workings were tapped, and as far as seen all the backs are taken away. A few rocks of tin are occasionally found in the attie, which shows there must have been a good lode, and looks well for our 44 fm. level below. We have resumed stope in back of the 54, west of cross-cut, where the lode is full 4 ft. wide, worth 8s. per fm. for tin. In the stope in back of the 20 the lode is 1 ft. wide, producing saving work, and we are daily expecting an improvement. The lode in the 45, north from engine-shaft, has improved, and will now intersect any more lode; we have, therefore, suspended it, and put the men to rise against the winze coming down from the level above (the 100). The stope in the 115 are yielding as follows:—The north one 1 1/2 fm., the middle one 1 1/2 fm., and the new, or south, one 1 1/2 fm. of lead ore per fm.

—T. Collins, Aug. 1: In the 31 west we have cut into the north lode, the north east lode has again reformed, as we expected, being now 2 feet wide, consisting of quartz, mundic, and lead ore, and yielding of the latter 1 1/2 ton per fm.; the stope in the back of this level, behind the last-named end, will yield 3/4 ton of lead ore per fm.

—FERSDON.

—J. Collins, Aug. 1: In the 31 west we have cut into the north lode, the north east lode has again reformed, as we expected, being now 2 feet wide, consisting of quartz, mundic, and lead ore, and yielding of the latter 1 1/2 ton per fm.; the stope in the back of this level, behind the last-named end, will yield 3/4 ton of lead ore per fm.

—GATWELL.

—J. Doidge, July 30: At our setting-day, on the 25th inst., we have made a good deal of progress, and the stope in the 115, west of the 100, is yielding 14 cwt. of lead ore per fm.

—LEADWOOD.

—J. Race, July 28: At our setting-day, on the 25th inst., we have made a good deal of progress, and the stope in the 115, west of the 100, is yielding 14 cwt. of lead ore per fm.

—HARWOOD.

—J. Race, July 28: At our setting-day, on the 25th inst., we have made a good deal of progress, and the stope in the 115, west of the 100, is yielding 14 cwt. of lead ore per fm.

—LEADWOOD.

—J. Doidge, Aug. 2: In the 40 cross-cut the ground is a little fm. wide, composed of flookan, quartz, white iron, and mundic—a very kindly ground for lead.

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—J. Doidge, Aug. 2: In the 40 cross-cut the ground is a little fm. wide, composed of flookan, quartz, white iron, and

A pitch in the back of this level is now working at 5s. 6d. in 17. The 50 fm. level west, on Flat or Cowling's lode, has been driven 3 fms. 0 ft. 6 in., and produced a little saving work; now, however, the lode looks more promising. The 50 fm. level east, on the same lode, has been extended 4 fms. 4 ft., and the lode in the present end is worth 8s. per fathom. In the back of this level is a good bunch of tin, now working by six men, at 3s. in 17. The winze below the 50 fm. level is sunk 2 fms. 1 ft., and holed to the 60, and well ventilated the bottom of the mine. The 50 fm. level, west of cross-course, on new lode, has been extended 6 yards through good tribute ground, and the lode in the present end is worth 10s. per fathom. The 50 fm. level cross-cut, on main cross-course, has been extended south 20 fms. through tin ground nearly the whole distance; the present end is without any tin branches just now, but from its appearance we think it near one of the gossans seen in the 40 fm. level south cross-cut. The 40 fm. level east, on the Plink lode, is extended 6 fms.; a small gossan has intersected it near the end, by which the lode is poor. We have commenced to put in the tramroad in the 50 fm. level, and hope to complete it in the course of a week or ten days, and are also pushing on with all speed the works for the erection of a drawing-machine in connection with the steam-stamps. These things completed, we propose to set on an additional pair of men to open out the new lode on the east of the cross-course in the 50 fm. level; this and the additional three men on tribute in the 38, pitch set to-day, according to present appearance, we think will enable us to increase the returns so as to meet the expenditure, which, considering the present price of tin, is very satisfactory, and anything like a return to former prices will enable us to make a profit.

**POLBREEN.**—July 31: We have holed the winze in bottom of the 12 to the rise from back of the 22, which has given good ventilation for driving the end in the 22. The 22 is being driven west from the rise, by three men and three boys, but no lode to be seen; we shall push on the end with all possible dispatch with a full pair of men. The winzes after hoing were put to sink another winze, about 25 fms. west of the winze last holed, in a good lode, but only sunk 7 feet before they cut too much water to sink in. We then put the men to drive the 22 fm. level cross-cut north from the rise towards the north part of Tregay's lode, which we calculate on cutting some time in this month. The lode in the adit end west is small, but continues to yield good work; the back is set to four men, at 11s. in 17. The lode in the adit end east is better; it is 8 or 9 inches wide, and worth 15s. per fm.; this will set at a lower tribute when laid open. Last month we set a pitch to four men in the back of the 12, at 7s. 6d. in 17, and we calculated on the shoot of tin holding up to the adit, it being just under a good shoot of tin; but these men rose up on the back of the lode, to communicate with the pair in the bottom of the adit, but when they holed it proved to be very small and poor, so we have now set the pitch in back of the 12, to four men, at 12s., and the pair from the bottom of the adit we have set in back of the adit at 11s. in 17. The bunch of tin in the adit end east is still to the east of the pitch in back of the 12, so we calculate on having a good pitch in that ground after a little time.

**PRINCE OF WALES.**—W. Gifford, July 31: In the 45 east the lode is worth from 30s. to 40s. per fm.; very little done since Saturday. In the 45 west the lode is 6 feet wide, and worth 2 tons of copper ore per fm. The engine-shaft remains sinking under the 45, by nine men. The engine works satisfactorily.

**PROSPER UNITED.**—J. Nicholls, Aug. 2: The lode in the 90, west of Hill's, is 18 in. wide, producing good stones of ore. The 90, west of Hand's, is unproductive. The 80, west of Hand's, is producing 3 tons of copper ore per fathom. The winze in the bottom of this level is producing 2 tons of ore per fathom, and some saving work for tin. Hand's winze, in the bottom of the 70, is producing 2 tons of ore per fathom. The 70 west is poor. The 70 west is poor. The 60 and 70 west are producing saving work for copper and tin. No change to notice in any other part of the mine.

**REEDMOOR.**—T. Taylor, Aug. 2: We have cut two small branches in the 52 east, containing spots of silver-lead ore, &c.; the lode is still producing black copper ore, mixed with lead; the ground is a little harder. There is no change in the north cross-cut, save it is letting out a little more water.

**REINNIE LAXEY.**—Wm. H. Rowe, Aug. 1: We are again in full working order at the engine-shaft; it is now 15 ft. below the 20, and I have set a bargain to the men to sink 8 fms. (or to the 30), at 3s. 10s. per fm., they delivering the stuff to the surface; and considering the double handling of stuff, and large wet shaft, I do not think they are too well paid. The vein in the shaft is just now producing occasional stones of lead.

**ROARING WATER.**—H. Thomas, July 30: There is no particular change in the ground in Gilman's engine-shaft since last reported, except the elvan is stronger in the north side of the shaft. In taking down the ground, north side of Grady's engine-shaft, we find the lode in that direction to be greatly crystallized, and from appearances it will shortly improve, and, no doubt, become a valuable lode. We have not taken down the lode west of the shaft during the past week, but shall do so in a few days; the ground by the side of the lode is just now producing occasional stones of rich ore.

**ROSECLIFF AND TOLCARNE.**—R. Pryor, Aug. 1: The men are now busily engaged in fixing the plunger-lift at the 30, consequently there has been but little change to notice in the underground department since our last report. No little change will be lost in completing this lift.

**ROSEWALL HILL AND RANSOM.**—R. F. Teweek, Aug. 2: The lode in the 100 fm. level end, east of Ransom, is improved, now worth 12s. per fm. The lode in the stopes in the back of this level is worth 10s. per fm. The lode in the 90 fm. level end is worth 6s. per fm., and in the bottom 18s. per fm. The lode in the 85 fm. level end is worth 12s. per fm. The lode in the stopes in the back is worth 8s. per fm.—Engine-shaft: The lode in the bottom of the 170, east of said shaft, is worth 30s. per fm. No other change to notice.

**ROSEWARNE CONSOLS.**—J. Nancarrow, R. Knuckey, July 30: Ellen's shaft is down to the 100, and the driving of the 100 east will be commenced this week. This end will be pushed on to get under the eastern ore ground as soon as possible. The lode in the 90 east is improving in size and appearance as it is getting into the ore ground driven through in the 80. The winze below the 80 east is worth 4s. per fathom; here there is not much lode broken since last report, but it improves as it goes down. The stopes in back of the 80 east are better; each is now worth 7s. per fathom. The 20, west of Ellen's, has recently yielded stones of ore, and we are now nearly over the ground driven through in the 30, so that an improvement may be expected here. There is a fine-looking lode in the 80, west of sump, which is 2 feet wide, composed of quartz, mafic, felspar, prian, and a little ore. This end is letting out a great deal more water than usual, and has every appearance of soon becoming valuable. The lode in the 70, west of sump, is smaller than usual, but the ground is most congenial for ore, and there is no doubt but in the driving of this end and the 80 westward good ore ground will be met with, and the junction of the main lode with the caunter in the western ground, as well as the rich appearance of the lode west of that point, tend strongly to confirm this opinion. We, therefore, use every exertion to get these ends on as fast as possible. The pitches look just at the setting, and yield the usual quantity.

**ROSEWARNE UNITED.**—T. Richards and Son, W. Temby, Aug. 2: Giesler's engine-shaft is sunk 3 ft. below the 80. The lode in the 80 west is for the present unproductive. The lode in the 70 west is Boundary shaft, is worth 6s. per fm. There is no further alteration in any other part of the mine.

**SILVER VEIN.**—Jas. Seccombe, E. Burn, Aug. 1: The north engine-shaft is sunk 17 fms. 1 ft. 6 in., leaving 2 fms. 4 ft. 6 in. now to sink to reach the 70 fm. level. The ground has become more favourable in the last fathom sunk, and it continues as at present the lift will be completed in about three weeks after this. Twelve men are employed in this work, and every exertion is being made to reach the 70 fm. level at the earliest possible date. There has been no change in the lode since our report of July 12; it continues to yield occasional rich stones of fahlerz, and presents a very encouraging appearance.

**SORTRIDGE CONSOLS.**—J. Richards, Aug. 2: Hitchins's engine-shaft, below the 122, is in favourable ground, and good progress is being made. In Bowe's rise in back of the 40, east of the eastern shaft, on the south part of the main lode, the lode is of fair size, 2 ft. wide, and is worth 1½ ton of ore, or 6s. per fm.

**SOUTH CARADON.**—Peter Clymo, July 31: The present ends on the different lodes are not looking so well as they have for some time past, but this is a circumstance of which we do not take much notice, as we have seen them so many times before. Our reserves are good, but owing to the continued depression of the copper standard, we have not thought it right or prudent to sell so much; consequently, our last two sales have been 100 tons less each, and, of course, the amount realized in proportion. We, therefore, cannot recommend our partner to pay more than a 5s. dividend this day. We hope ere long the standard will improve, so as to enable us to resume our former dividends.

**SOUTH CONDURROW.**—J. Vivian and Son, July 30: In the course of the last week we have been engaged in altering the pitwork, fixing plunger-lift at the 40 in the engine-shaft, &c., which we have pleasure in saying is now in complete order of working, and the water in fork again. The engine will now work much lower than heretofore, and, consequently, make a considerable amount of difference in the consumption of coal. We have nothing particularly new to report since our last, the different points of operation being without change to notice.

**SOUTH DARREN.**—J. Boundy, July 31: On Saturday last the following bargains were let:—The 60 to drive west by six men, at 5s. per fm.; the lode is 2 ft. wide, worth for lead and copper ore 10s. per fm.; the channel of ground is every thing that can be desired for mineral, and we are pushing on this end as fast as possible to get under the ore ground in the 50. To stop the back over this level by four men, at 8s. per fm.; the lode is 2 ft. wide, worth for lead and copper 9s. per fm. The 50 to drive west by six men, at 8s. per fm.; the lode is 2 ft. wide, worth for lead and copper ore 14s. per fm., and is in a good channel of ground for the production of lead ore. To stop the back over this level by ten men, at 8s. per fm.; the lode is 3 ft. wide, worth for lead and copper ore 18s. per fm. To stop the back over this level, east from the winze, by six men, at 8s. per fm.; the lode is 2½ ft. wide, worth for lead and copper ore 14s. per fm. The 40 fathom level to drive west by six men, at 9s. per fathom; the lode at this point is 2 feet wide, worth for lead and copper 14s. per fathom, with every indication of soon becoming more productive. To stop the back over this level by six men, at 8s. per fathom; the lode is 2½ feet wide, worth for lead and copper 13s. per fm. The 30 to drive west by four men, at 7s. 10s. per fm.; the lode is 18 in. wide, yielding a little ore, and judging from present appearance I think a change for the better will shortly take place. To stop in the 30 west by four men, at 7s. per fm.; the lode is 2 ft. wide, worth for lead and copper 8s. per fm. Good progress is being made in sinking the winze below the 40 west. The 70 west not taken at the price offered.

**SOUTH HERODSFORTH.**—W. Roberts, Aug. 1: In the 56, driving east, the lode appears to be improving; it is now 1 ft. wide, producing good stones of ore; in the same level west the lode is small, and disordered by a small cross-course. In the winze sinking under the 46 no lode taken down for the past week. The cross-cut at the 36 is in favourable ground; we expect to drive 3 or 4 fathoms more before intersecting the lode.

**SOUTH WHEAL HERODSFORTH.**—Wm. Goldsworthy, Aug. 1: The engine-shaft is in regular course of sinking below the 70; the ground still continues favourable for sinking, and good progress is being made. The engine and machinery are in good order, and working well.

**SOUTH WHEAL GRENVILLE.**—G. R. Odgers, Wm. Bennetts, July 28: To-day we have set the engine-shaft to sink below the adit, by nine men, at 22s. per fathom. The lode is 3 ft. wide, composed of branches of spar, &c., traversing an evan. We hope by the end of next month to be at the 15, when we shall commence driving both east and west.

**SOUTH WHEAL TOLGUS.**—Youren's Lode: In the 150, west of Mitchell's engine-shaft, the lode is 1 foot wide, composed of soft spar, mafic, and stones of good ore, and has a very kindly appearance. In the 110 west the lode is about 8 in. wide, producing ½ ton of ore per fm., worth 6s. per ton; price for driving 2s. 5s. per fm. The lode in the stopes over the back of the 110 west is producing ½ ton of ore per fm., worth 6s. per ton; price for stoping 2s. 5s. per fm.—South

Lode: We have commenced taking down the lode in the 150 east, and also in the stopes over the back of the 150 east; as far as we can judge of what is taken down, the lode in the end and in the stopes is looking quite as well as when last taken down; we shall be able to say more about it by Saturday next. The lode in the winze just commenced to sink in the 140 east is about 15 in. wide, at present unproductive. The ground in the 164 cross-cut south is moderately easy. The ground in the 100 cross-cut north is stiff killas; this level is letting out a quantity of water.

**TIN HILL.**—W. H. Willcock, Aug. 2: We are continuing the sinking of our new engine-shaft satisfactorily, the ground being more easy to work. We are down to the water level of this district. I am preparing to arrange the machinery for drawing the water, &c.

**TOLCARNE.**—Aug. 1: Field's Lode: In the 40, east of Field's shaft, the lode is 18 in. wide, producing ½ ton of ore per fm., worth 3s. per ton; price for driving 2s. per fm. In the winze sinking below the 30, east of Field's shaft, the lode is 15 in. wide, consisting of gossan, soft spar, intermixed with black ore, worth about 30s. per fm.; price for sinking 1s. 15s. per fm.—New North Lode: In the 60, west of Field's shaft, and west of the cross-cut, the lode is 20 in. wide, composed of fluor and other spar, with good stones of ore, and letting out more water than usual, and has a very promising appearance. The lode in the 50, west of the cross-cut, is 10 in. wide, consisting of gossan and prian, intermixed with a small quantity of black ore, but not to value. In the 40, west of the cross-cut, the lode is 15 in. wide, a pretty-looking lode, producing 2 tons of ore per fm., worth 3s. 10s. per ton; price for driving 2s. 10s. per fm. The lode in the 20 is small and unproductive. The ground in the adit level cross-cut south is much the same as when last reported, rather stiff killas.

**TREVENEN AND TREMENHERE.**—J. Madlyn, C. George, Aug. 1: The 197 yields a little tin, but not to value. The 187 end is worth 8s. per fm. The 162 is east poor. The 150 east, on south lode, is worth 9s. per fm. The stop in this back is worth 10s. per fathom. The 140 west, in the country, against the old shaft, is square for progress. The same shaft, sinking in the country below the 140, is better for progress, and we hope to make the communication here within this month, when both levels will be well ventilated. The stop in back of the 140, west of the latter shaft, is worth 7s. per fm. The stop in the bottom of this level is worth 6s. per fm. The lode in the 130, east of new sump, is getting larger, and the country more congenial for tin. The 130, west of this shaft, on north lode, yields a little tin, but not to value.

**TREWEATHA.**—T. Foote, J. Scoble, Aug. 1: The shaftmen are now engaged in cutting ground and putting in timber, so as to enable us to commence sinking the engine-shaft under the 50. There has been nothing done in the 50 south during the past week, owing to the shaftmen being engaged in the work referred to, but as soon as this is completed (which will be by Friday) we shall resume driving the 50 south again. The lode in the 50 north is 3 ft. wide, worth 3 cwt. of lead per fm.; the stop in the back of this level will produce 3 cwt. of lead per fm. We are making good progress in clearing and securing the 40 north—in fact, we can see the end; a few days more will enable us to drive this end. In the 40 south we have got through the worst part of the run, and are now making good progress in clearing. The three stopes in the back of this level will produce, on an average, 4 cwt. of lead per fm. The stop in the back of the 40 north will produce 3 cwt. of lead per fm. The lode in the 30 south is 2½ ft. wide, but poor; the same will apply to the rise in the back of this level. The lode in the winze sinking in the bottom of the 20 south is 2 ft. wide, producing 5 cwt. of lead per fm., and the stop in the back of this level 6 cwt. of lead per fm. No other change. At surface we are getting on well with the crusher, and are also engaged in putting up a small water-wheel to work Hunt's patent ore-separating machine on the old burrows, and which we think will well pay for working over by this machine.

**VIGRA AND CLOGAU.**—W. J. Holman, Aug. 2: Since last report there has been a steady improvement in the No. 1 sink 20, 2 mine; the first three days yielding small stones containing visible gold. On Monday and Tuesday last the gold increased, and there is a very good prospect of gold visible in the west end of the shaft near to the bottom, which will be taken down in the course of a day or two. The dip of the shoot of gold westward is apparently carrying the main part out of the sink, and we shall be obliged to deepen the sink to follow it; six men are now at work in this sink. From No. 3 sink, which is west of No. 1, the drivage east is within 16 fms. of No. 1; set to four men; the lode is hard and large, but is improving, showing copper ore and a little bismuth, which usually indicates the approach to gold. Between this driving and No. 1 sink there is a promising piece of ground, and from this level we shall be able to reach the shoot of gold dipping under it from No. 1 sink. The driving west from No. 3 is suspended, in order to push on the east end. From No. 2 sink, which is again west of No. 3, the adit level is being driven eastward by four men, to reach deeper ground than is commanded by Nos. 1 and 3 sinks. The dip of the shoot from Nos. 1 and 3 is towards this end. At the No. 1 Mine the stoping under the adit is, for the moment, suspended. The lode has not yet been cut west of the cross-course; the top soil is very deep, and the surface of the rock is deeper than the bottom of the trench. At the old Clogau Mine the timbering down of the new shaft is nearly completed, and we shall shortly commence to sink for the incline shaft.

**WEST MARIA AND FORTESQUE CONSOLS.**—W. Skewis, J. Donnal, Aug. 1: We have cut the south wall or capes of the West Maria lode in the 60 cross-cut, north of Maria engine-shaft; it is letting out water very freely, and is very hard; it is, therefore, necessary to open the level wide before we can cut through it; this will occupy a few days. The West Maria lode in the 30, east of this shaft, is over 4 ft. wide, and is looking better than it has been for some time past, yielding saving work, a very promising lode. There is no change to notice in the 40 east. In the 40, west of this shaft, we have the West Maria lode, but enough is not yet done to give the proper size; so far as seen it is large, from 3 to 4 ft. wide, producing saving work.

**WEST NANTY.**—Aug. 1: The 60 fm. level stope above the deep adit, west of engine-shaft, will yield 12 cwt. of lead ore per fathom. The 10 fm. level stope, above ditto, will yield about 11 cwt. of lead ore per fm. We expect to have by next Saturday about 15 tons of lead ore in the bin.

**WEST SHARP TOR.**—Wm. Richards, July 31: There is no change to report in the cross-cuts in the 150, 162, and 174 at present. The lode in the stopes in back of the 162 yields 18t. worth of ore per fm. The part of lode being carried in the 174 east contains iron, quartz, capel, and a little grey copper ore occasionally. The part of lode being carried in the 174 west contains capel, quartz, pebbles, a little green carbonate and red oxide of copper, and good stones of copper ore.

**WEST WHEAL TOLGUS.**—Aug. 1: Taylor's sumpkins are cutting tip-plate at the 85. In the 85 east the part of the lode that is being carried is 4 ft. wide, producing 2½ tons of ore per fathom, worth about 7s. 10s. per fm.; price for driving is 11s. per fathom. The lode in the 85 west is 15 inches wide, producing 1 ton of ore per fathom, worth 3s. per fathom; price for driving is 6s. 6s. per fathom. We think there is no more lode standing to the north, if so, it will be taken down in a day or two. The lode in the 75 west is 3 feet wide, consisting of spar and stones of ore, not looking as well as it was. In the 75 east the lode is 3 feet wide, producing 2 tons of ore per fathom, worth 6s. per fathom; price for driving is 4s. 10s. per fathom. The part of the lode that is being carried in the 75 west is 1 foot big—unproductive. We are carrying more of the south ground (killas) to make speed. The lode in the winze west of the shaft, sinking below the 75, is 3 feet wide, producing 1 ton of ore per fathom, worth 3s. per fathom; price for sinking is 12s. per fathom. We have five stopes over the back of the 75, three east of shaft and two west, working by 30 men, at an average price 2s. 12s. per fathom; each stope will average about 3 tons of ore per fathom, worth 9s. per fathom. The lode in the 65 has not been taken down since last reported, but will be taken down by Saturday next. In the rise over the back of the 65 west the lode is 5 ft. wide, producing 4 tons of ore per fathom, worth 12s. per fathom; price for rising is 5s. per fathom, but this is not a fair price; we shall have to give something more. The mine is now about 4 feet above the back of the level, and is very wet. The lode in the stope over the back of the 65 west is 3½

bris, and troublesome to work by open trenching, a short cross-cut is being put in to intersect it in deeper and firmer ground. At the time of the mail leaving its intersection was immediately expected. In Atutlca Mine some very fine stones of galena and cassiterite from the shallow adit on Silde lode have been broken, assays of which have given 52, 32, and 45 ozs. respectively. The men sinking Ortiz's vein under this level holed to old workings, which have not been examined, owing to foul air. The raisings from the various mines in May were as follows:—

	T.	c.	q.	Ley.	Ozs. of Silver.
San Pantaleon	15	0	0	44 <sup>5</sup>	667 <sup>5</sup>
San Carlos	31	12	0	70 <sup>5</sup>	2227 <sup>8</sup>
Atutlca	0	15	0	45 <sup>5</sup>	34 <sup>0</sup>
Total	47	7	0	9 tons.	2929 <sup>3</sup> ozs.

The 31st remittance of silver, consisting of nine bars, worth about \$7300, was forwarded to Guatemala on May 11, and a letter from Mr. Trenear, who accompanied it, has been received from that city, advising its safe arrival.

## REVIEW OF THE IRON TRADE.

The enquiries for rails continue on a fair scale; about 15,000 tons have been placed in Wales, on Russian and American account, and it is thought there may be some further autumn demand for the United States, seeing that the Southern railroads are badly off for iron. Unhappily, however, they are rarely in a position to make the reimbursement entirely in cash; consequently, business is limited to some extent; but hereafter, as the country gets daily more and more into debt, some credit may, perhaps, be safely extended to those lines, in which case a demand for British rails would undoubtedly spring up during the prevalence of the present low prices on this side of the Atlantic, and of an unaltered tariff under the North of England ironmasters, still hampered with too highly paid labour and strikes, are (with the exception of the Stockton Works) excluded from whatever orders may come upon the market for malleable iron at present, and all contracts must go either to the Principality or Staffordshire.

The invitations issued by the Northern of France Railway Company for tenders for 4000 tons of rails were responded to by some London firms, but all the offers, English, French, and Belgian, were above the minimum fixed by the directors (190 frs.). The contract, therefore, was not let last week, although doubtless, it will be ultimately taken by French or Belgian ironmasters. A protective duty of 60 frs. per ton is still payable in France on imported rails, although we have what is facetiously called a "free-trade" treaty with the country; but, under these circumstances, it is clearly shown that "no Englishman need apply" for any French contract for iron rails. As regards the Great Northern (England) Railway Company's contract for rails with a leading Welsh house, mentioned in our last, it has since been stated that the sale is accompanied by no guarantee of duration whatever, as, indeed, the price of £175. 6d. at Doncaster, and £1. 15s. in London, at which it was made, would suggest. In all other departments of the iron market business remains absolutely paralysed, and there are no signs whatever of immediate relief in any direction; on the contrary, fresh suspensions in Glasgow and Middlesbrough have taken place, and distress and suffering pervade the producing districts of Cleveland, both for masters and men, while the latter continue stubbornly to resist the proposed reduction of wages at all the mills and furnaces, save those of two or three proprietors.

The specifications for the Indian rails are not yet in the hands of the trade; they will, most likely, constitute a requisition for close upon 18,000 tons of iron, a quantity which is, of course, a mere flea-bite in relation to the enormous productive powers of our rolling-mills now. Some of the home lines of railway are also represented as starving for want of iron, but as they are equally suffering from sore financial embarrassment, orders cannot be given out while the money market maintains its present state of tension, which means nothing less than the direst ruin and destruction to the mining and manufacturing interests of the United Kingdom, let our *doctores* say what they may. It is impossible that the industry and capital employed in iron-making, loaded, as of late, with a discount rate of (practically) 12 per cent., and having still to encounter highly hostile foreign tariffs, can successfully contend with the cheaper money and cheaper labour of the continent of Europe, so that unless some important change takes place in these respects the English export trade in iron may soon decline to a point that, at all events, exonerates us from the recent singular reproach of Mr. Stanley Jevons—that of "committing national suicide." In every foreign shipment we make of the products of our iron fields, because of the absorption of coal therein involved. In the meantime, what is to become of the classes subsisting by manual labour in smelting and rolling iron in Northumberland and Durham baffles all conception.

The Welsh Steam Coal Trade is reported as enjoying the sunshine of high material prosperity, at a time when the cold shadow of unprofitableness rests upon iron; this state of affairs alone prevented that fall in wages from taking place which the position of the latter article required, as evinced by the notices given at the various works, but since rescinded. It has been argued—given, therefore, the maintenance of the present scale of wages to rollers and foremen in South Wales, from the peculiar position of the coal trade—given also the continued silence of death in the lately busy ironworks all along the Stockton and Darlington Railway, whereby a production of fluted iron, roughly estimated at 7000 tons per week, is extinguished *pro tem.*, and probably 10,000 to 12,000 stout fellows placed in voluntary, or rather Union-enforced, idleness—that were there now to arise anything like an average and normal demand for rails, merchant bars, plates or angles, the Welsh ironmaster must largely benefit by the strike in the North, as the value of Welsh iron would immediately improve in the market. Many persons are sanguine enough to think that, in prospect of peace and a good harvest, this result will even now certainly happen, and but for the panic-stricken condition of commerce, and the chronic state of distrust which subsists, no doubt the worst of this *annus mirabilis* ought to have been past and done with, so far as the iron trade is concerned. As yet, however, the most that can be said is that the week closes with less despondency and dulness of feeling than lately prevailed, without any desire whatever to make purchases of any kind of iron for forward delivery, or more than is wanted for immediate use. Welsh manufacturers are, at the same time, firmer, and, in the event of a protracted struggle between the ironworkers and the ironmasters of the East Coast districts, prices might soon return in Wales to, at all events, the non-losing point of £1. 10s. per ton, f.o.b., for bars and rails, below which they have recently been selling, G. B. TOMS AND CO.

The ROYAL CORNWALL POLYTECHNIC SOCIETY's thirty-fourth Annual Exhibition will commence on September 14, and be continued for six days thereafter. As will be seen from the advertisement in another column, silver and other medals and money-prizes are awarded to the more deserving exhibitors, whilst no charge for space is made to those competing. Apart from the honour attaching to the possession of the honours awarded by the society to the successful exhibitors, the annual exhibition affords an opportunity, not elsewhere to be found, for manufacturers and others to bring their productions prominently before those likely to take an interest in them; for inasmuch as the visitors invariably include not only the chief of the gentry and the ladies of the western counties, to whom the fine arts portion may be considered more especially attractive, but also the principal mine managers and agents, by whom the merits and shortcomings of almost every machine or contrivance intended for their advantage are carefully examined and freely discussed, so that the inventors are enabled to remedy defects which may exist, and thus perfect their inventions, and facilitate their general introduction for the purposes intended.

CHONTALES.—The directors have just issued a circular, in which they desire "to check the unfounded fears that may have arisen in consequence of rumours circulated since the arrival of the last mail." They state that "a considerable portion of the machinery has already reached the mines, and a large amount of work has been done in improving the road from Libertad, in clearing the ground, and in opening out the different mines. It is hoped that two water-wheels may soon be in full working order. Though, from the delay in getting up the machinery, some further time may elapse before the works at the mines are in full operation, the directors continue to receive from competent judges, who have seen the company's property since their last advice, an unvarying report of its being of great value and importance." These remarks confirm the statements repeatedly made in the articles which lately appeared in these columns. We also stated that remittances of gold were likely to begin to be received in September or October, and we have now reason to be still more confident that this will be the case. The dry season commences in October, and we believe that no doubt exists but that the heavy machinery will then be transported to the mines, it being already, we understand, within a comparatively short distance. We fully expect to see this undertaking one of the most profitable and successful of the present day.

MINERAL RIGHTS ASSOCIATION.—Several properties, presenting features of great value and importance, are before the directors. The board has a considerable amount of capital in hand, and with care and judgment may now lay the foundation of large profits for the shareholders. Full information will, no doubt, be given when the business is in hand is matured.

OTEA COPPER COMPANY.—Mr. Philip Wright, one of the directors, who has lately returned from visiting this company's property, has issued a letter to the shareholders, in which he assures them of the great value of the property, and that large returns may be confidently looked for. According to the prospects when he left New Zealand, in March, the machinery would be at work by the end of June, so that by this time, no doubt, they are vigorously at work returning the copper ore. The first shipment of upwards of 100 tons is expected to be made this month (August), the quality of which is estimated at 15 to 20 per cent.

LONDON GENERAL OMNIBUS COMPANY.—The traffic receipts for the week ending July 29 was £13,157. 5s. 2d.

## The Mining Market; Prices of Metals, Ores, &amp;c.

METAL MARKET—LONDON, AUG. 3, 1866.

COPPER.	£	s.	d.	IRON.	Per ton.
Best selected, p. ton	84	0	0	Bars Welsh, in London	7 0 0-7 5 0
Tough cake & tile	81	0	0	Ditto, to arrive	7 0 0-7 5 0
Burra Burra	85	0	0	Nail rods	8 0 0-9 5 0
Copper wire, p. lb.	0	11 <sup>1</sup> / <sub>2</sub>	—	Stafford, in London	8 10 0-8 17 6
Do. tubs	0	12	—	Bars ditto	8 10 0-10 0 0
Sheath, & bolts, p. ton	86	0	0	Hoops ditto	9 10 0-10 0 0
Bottoms	91	0	0	Sheets, single	10 0 0-11 0 0
Old (Exchange)	72	0	0	Pig No. 1, in Wales	4 5 0-4 10 0
Total	47	7	0	Refined metal, ditto	4 0 0-5 0 0
2929 <sup>3</sup> ozs.				Bars, common ditto	6 5 0-6 10 0
				Do. mch. Tyn or Fees	7 10 0-—
				Do., railway, in Wales	6 0 0-6 5 0
				Do., Swed. in London	11 0 0-12 0 0
				To arrive	11 10 0-—
				Pig, No. 1, in Clyde	2 12 3-2 17 3
				Sheets	8 1/4 d.
				STEEL.	Per ton.
				Swed., in kegs/crofted	13 0 0-14 0 6
				Do., (hammered)	15 0 0-16 0 0
				Ditto, in faggots	10 0 0-16 10 0
				English, spring	19 0 0-23 0 0
				QUICKSILVER (p. bottle)	7 0 0-—
				LEAD.	Per ton.
				English Pig, com.	19 10 0-—
				Ditto, ordinary soft	20 0 0-—
				Ditto, (WB)	22 10 0-—
				Ditto, sheep	21 10 0-21 15 0
				Ditto, red lead	23 10 0-24 0 0
				Ditto, white	27 0 0-30 0 0
				Ditto, patent shot	23 15 0-24 0 0
				Spanish	19 5 0-—

\* At the works, 1s. to 1s. 6d. per box less.

REMARKS.—We look forward with great satisfaction to the beneficial results likely to follow from the completion of the Atlantic Telegraph, which now connects London with America, as we have no doubt that this great work will prove of incalculable advantage in commercial affairs, and will be the means of adding greatly to the amount of business with the United States; and although it will prove detrimental to speculative operations, yet it will be of immense advantage in all legitimate transactions. We trust, also, that it may result in cementing the amicable relations of the two countries, and that it may cause a greater amount of good feeling to prevail than has hitherto done, by bringing us much nearer to each other, and affording quicker information as to the various movements in each country. We feel assured that the metal trade will greatly participate in the advantages resulting from this noble undertaking. The continuance of the Bank rate at 10 per cent. is becoming really serious, and the determination of the directors of the Bank of England to continue this high rate, in spite of lower rates being accepted in the open market, is being much called in question—much disappointment was felt that no alteration was announced at the meeting on Thursday. We trust, however, that a reduction will be made ere long, as it interferes very seriously with business operations. We fully anticipate that should peace be finally declared in Germany, and the money market become easier, we should see a much better state of things arising in the metal market, as there are already indications of coming improvement.

COPPER.—The market for this metal is certainly in an improving condition, and prices are much firmer; it is now exceedingly difficult to buy under smelters' prices. Foreign, also, is in much greater request, and both Burra and Wallaroo have been sold at 85<sup>1</sup>/<sub>2</sub> cash. IRON.—In Staffordshire no improvement can be reported in the demand for manufactured iron. At hardly any of the works is anything like the average make being produced, and the trade is as much depressed as it has been for some years past. There are hopes that the conclusion of peace may lead to a resumption of orders for the Continent, and that the delay in the passing of the United States Tariff Bill may cause more orders to come from that quarter. Four failures have occurred in the iron trade, which had previously been anticipated, the principal being in connection with previous embarrassments. In Welsh, in anticipation of a permanent peace in Germany, and the hope of a reduction of the rate of discount, the ironmasters have held a meeting to reconsider the notice that had been given to the men of a reduction in wages; and, after careful consideration, it has been agreed that the wages of all the men employed at the works should continue to stand as heretofore. The proposed reduction would have affected the men at least 10 per cent. The result has given the greatest satisfaction among the workmen, and it has been the means of keeping at home a large number of the most skilled workmen, who, in anticipation of the reduction being carried out, were making preparations for emigrating to the United States. In Swedish iron the demand is not so active, but holders are indisposed to give way in prices. In Scotch pig-iron the market has been rather quiet during the week, and the fluctuations have not been considerable; upon the whole, however, prices have rather improved, the last advice from Glasgow stating the price to be 52s. 3d. cash.

LEAD.—The demand is by no means active, although a slight improvement may have occurred. The present quotations are—common English pig, 19<sup>1</sup>/<sub>2</sub>. 10s.; LB, 20<sup>1</sup>/<sub>2</sub>; and WB, 22<sup>1</sup>/<sub>2</sub>. 10s. TIN.—The market for Straits has become rather firmer, and transactions have occurred at 76<sup>1</sup>/<sub>2</sub> cash and 76<sup>1</sup>/<sub>2</sub>. 10s. prompt three months. In Holland the stock of Banco on warrants on July 31 was 109,375 slabs against 30,700 slabs same time last year, and the arrivals towards next sale were 118,159 slabs, against 26,460 slabs same time last year. TIN-PLATES meet with a better sale, and, as a rule, quotations are pretty well maintained.

STEEL and QUICKSILVER without alteration.

BIRMINGHAM, AUG. 3.—Rylands' "Iron Trade Circular" says:—Trade continues depressed, only business in marked brands for standard consumption. Wire-rods and nail-rods slightly in request. The many people think, unnecessary continuance of the Bank rate at 10 per cent. not only causes much disappointment in monetary circles, and positive injury to commerce, particularly in metals, but puts a stop to all speculative business. In the MINING SHARE MARKET there is an entire absence of general business transactions, and still greater depression in prices. The copper market is rather better at Swansea, and immediately after the last Ticketing there a large quantity of foreign ores were sold by private contract, at 13s. 4d. per unit. Since then Chili carbonates have been sold at 13s. 6d.; and on Saturday last about 3000 tons of Chili regulus and ores were sold, at 14s. per unit.

In shares, the chief business has been in Prince of Wales, which advanced to 40s., and leave off 24s. to 26s.; the water was pumped out of the mine last week in little more than 24 hours, when it was inspected by several agents, whose favourable reports more than confirm all that has been said of the value of the lode, and of the general prospects of the undertaking. Great fluctuations will naturally take place in shares in a dull and depressed market, where scarcely any shares are saleable, for when there are no orders to buy, the price is put down, and when orders appear, shares are difficult to get at quotations. During the whole week these shares have been almost the only ones dealt in. East Caradon shares are not so firm, at 6<sup>1</sup>/<sub>2</sub> to 6<sup>1</sup>/<sub>2</sub>; the caunter lode in the 100 is producing stones of ore, and the other ends in the mine, in the aggregate, are worth 77<sup>1</sup>/<sub>2</sub> per fathom. Minera annual accounts, made up to the end of June, show sales of lead ore, 68,363<sup>1</sup>/<sub>2</sub>. 14s. 6d.; blonde, 14,349<sup>1</sup>/<sub>2</sub>. 12s.; lead and blonde in

hand, 5779<sup>1</sup>. 18s. 1d. The costs were 37,813<sup>1</sup>. 12s. 9d.; royalties paid, 7119<sup>1</sup>. 10s. 3d.; profit, 37,241<sup>1</sup>. 7s. 9d. Great Retallack shares have been in demand, and leave off 10s. to 15s.; the mine has fine prospects for lead, and is nearly paying for blonde. Bedford United, 12s. 6d. to 17s. 6d.; Camborne Vean, 1 to 14<sup>1</sup>; Chiverton Moor, 4<sup>1</sup> to 44<sup>1</sup>; Chontales (gold), 2<sup>1</sup> to 2<sup>1</sup>; Clifford Amalgated, 5 to 5<sup>1</sup>; Carn Camborne, 10s. to 15s. East Basset, 13 to 15; at the meeting the accounts showed a loss of 142<sup>1</sup>. 9s. 5d. on the two months' working, and a balance in favour of the adventurers of 390<sup>1</sup>. 16s. 10d. In the 100 cross-cut, east of new shaft, the agents expect to cut the north part of the lode in about 6 ft. driving. Cook's Kitchen, 2<sup>1</sup> to 2<sup>1</sup>; Devon Great Consols, 420 to 440; East Carn Brea, 17s. 6d. to 20s.; East Lovell, 5 to 5<sup>1</sup>; East Rosewarne, 5s. to 10s.; East Russell, 2<sup>1</sup> to 2<sup>1</sup>; East Wheal Grenville, 2 to 2<sup>1</sup>; Frontino and Bolivia, 9s. to 11s.; Great Laxey, 19<sup>1</sup> to 20<sup>1</sup>; Great North Laxey, 32s. 6d. to 37s. 6d.; Great Wheal Vor, 18 to 19; Great Wheal Fortune, 14 to 21; Herodsfoot, 30 to 32; Hindgton Down, 3 to 3<sup>1</sup>; Marke Valley, 3<sup>1</sup> to 3<sup>1</sup>; Mineral Rights, 7 to 1; North Roskar, 1 to 2; North Tresekby, 2 to 2<sup>1</sup>; Rosewarne United, 5s. to 10s.; South Condurrow, 9s. to 11s.; South Crofty, 9s. to 11s.; South Frances

manner in which the works were being carried out, and gave Capt. John Kitto and the directors great credit for the exertions they were using to bring the mine into a profitable state. The usual courtesies to the Chairman terminated the proceedings.

At North Crofty Mine meeting, on July 26, the accounts showed a debit balance of 784L 11s. A call of 2s. 6d. per share was made. Capt. Vivians, Thomas, and Bennetts say—"We are happy to say that the mine continues to open up very well, and we contemplate raising in the next four month from 45 to 50 tons of tin."

At East Basset Mine meeting, on Tuesday, the accounts showed a credit balance of 390L. The loss upon the two month's operations was 142L.

At Crane Mine meeting, on July 26, a call of 2L per share was made.

At Peden-an-drean Mine meeting, on Tuesday, the accounts showed a credit balance of 912L 11s. 2d. The arrears of calls are 1419L 15s. 3d.; and owing to merchants', 4293L 13s. 8d. A call of 6s. per share was made. Capt. Tregay and Thomas say—"The shareholders' determinedly push through the present time of low price of tin, until a fair price is obtainable, these mines will presently repay shareholders the expenses already sustained, and reward the trouble and anxiety in carrying them through."

At Wheal Sparnon meeting, on Tuesday, the accounts showed a debit balance of 3490L. The arrears of calls are 306L 13s. 6d. A call of 6s. per share was made. Capt. Tregay and Chegwin say—"We think we are likely ere long to realize something more substantial than promises, both on the south lodes, the rise in back of the 20, and in the bottom of the sump, where we shall soon reach the dip of the shoot of tin in the western stope, and, no doubt, of its improving as it goes down. These are the objects we have in view, and each of them offers good prospects of early success."

At the Hawkmoor Mine meeting, on Tuesday, the committee were empowered to invite tenders for the sett, plant, and machinery, by advertisement or otherwise, and that it be left to their discretion to accept or decline any tender that may be made.

At the Consolidated Copper Mines of Cobre Association meeting on Tuesday (Mr. H. R. Grenfell, M.P., in the chair), the report of the directors was adopted, and it was agreed to increase the capital from shares of 40L to 50L each, and to register the company with limited liability. Details elsewhere.

At Port Phillip and Colonial Gold Mining Company (extraordinary) meeting, on Monday (Mr. John Diston Powles in the chair), the usual distribution of 1s. per share (being at the rate of 10 per cent. per annum), on account of the year's profits, was declared. Details in another column.

At the Australian Mining Company annual general meeting, on Monday (Col. G. Palmer in the chair), the directors' report was adopted. Details in another column.

At the English and Australian Copper Company meeting, on Thursday (Mr. R. A. Routh in the chair), the report, which, considering the position of the copper trade, was by no means unfavourable, and the accounts were unanimously adopted. Details in another column.

The Bank of England return for the week ending on Wednesday evening was decidedly unfavourable, but this may be in a measure accounted for by assuming that many have been preparing for the fourth (or rather third) of the month. The repayments to the Bank upon the "other securities" show scarcely any diminution, and whilst this item stands fully 5,000,000, too high, with the reserve 2,000,000, too low, there can be no substantial grounds for expecting a diminution in the minimum rate, and should such a step be determined upon it could only have the effect of creating a temporary improvement, at the cost of a more disastrous loss of confidence in a few months. The continued announcement of both bank and traders failures proves beyond question that the unhealthy note has not yet been separated from the healthy parts of the commercial body. There is, nevertheless, signs of gradual, though steady, return to solidity, and if the Bank's position improves during the next month to an extent equal to the improvements of the last, a very different feeling in commercial circles may be anticipated. In the ISSUE DEPARTMENT there is shown an increase in the notes issued of 39,215L, represented by a corresponding increase in the coin and bullion on the other side. In the BANKING DEPARTMENT there is shown on the Habillity side a decrease in the "other deposits" of 807,918L, from which must be deducted an increase in the "public deposits" of 672,131L, an increase in the "seven day and other bills" of 51,884L, and an increase in the "rest" of 28,666L—total, 752,621L: leaving a total decrease on the liability side of 53,297L. On the asset side of the account there is shown an increase in the "Government securities" of 300,000L, from which must be deducted the decrease in the other securities of 174,948L—125,052L, which added to 55,297L, the decrease on the liability side, shows a decrease in the total reserve of 180,349L.

On the Stock Exchange there has been a fair demand for Mining Shares during the week. The following prices were officially recorded in British Mines:—West Chiverton, 67; Herdfoot, 30, 32; Great Laxey, 19 $\frac{1}{2}$ , 20 $\frac{1}{2}$ , 19 $\frac{1}{2}$ , 20 $\frac{1}{2}$ , 19 $\frac{1}{2}$ ; Chiverton, 5 $\frac{1}{2}$ , 5 $\frac{1}{2}$ , 6; Great Wheal Vor, 1 $\frac{1}{2}$ , 18, 19. In Colonial and Foreign Mining Shares the prices were:—Cape Copper, 8 $\frac{1}{2}$ , 9 $\frac{1}{2}$ , 9; Scottish Australian, 4; Yudanamutana, 5, 4. In Foreign Mining Shares the prices were:—St. John del Rey, 48, 47 $\frac{1}{2}$ , 47, 48, 46 $\frac{1}{2}$ ; Chontales Gold, 1 $\frac{1}{2}$ , 1 $\frac{1}{2}$ ; Washoe Gold, 1 $\frac{1}{2}$ , 1 $\frac{1}{2}$ , 1 $\frac{1}{2}$ ; Frontino and Bolivia Gold, 4, 5, 5; Cobre Copper, 6, 1, 2, 3, 4, 2 $\frac{1}{2}$ , 2, 3; Don Pedro North del Rey, 5 per cent.

**THE COPPER TRADE.**—Messrs. Vivian and Younger (Aug. 2) write:—"Early in the week a strong demand set in for all descriptions of raw copper. There were eager buyers of fine foreign and tough, at a considerable advance on last week's prices, and orders were offered the smelters so freely for tough ingots that they declined to sell at their quotations. This demand was principally speculative, and when it was announced that no alteration was made in the Bank rate buyers were by no means anxious to operate, and the market closed quiet, with a tendency to go back a little. The general demand has been rather checked by the advance asked. The mail from Chile, delivered on Monday, advised four charterers only. The probable shipments from thence for the second quarter of this year being estimated at 12,000 tons, making 25,000 tons for the first six months. Notwithstanding the heavy sales out of stock during the last month, amounting (exclusive of that sold at the Tickets) to over 5500 tons of fine copper, the stock of the first of the month showing the trifling reduction of about 200 tons, which is not so favourable as might have been anticipated. The available stock of bars, ores, regulus, and English, in Liverpool, Swansea, London, and Havre is thus estimated in fine copper:—Aug. 1, 1866, 19,616 tons; Aug. 1, 1865, 16,980; Aug. 1, 1864, 16,327 tons."

**THE COPPER TRADE.**—Mr. Pitcairn-Campbell (Liverpool, July 31) reports:—"Before the dispatch of the last mail, and speedily after the issue of our report, the smelters reduced their official quotations 5L per ton, to 86L for manufactured, and 81L for unmanufactured; but, as they had already accepted even lower prices than these, no effect was produced by the step. Importers having freely met the market, very large transactions have taken place during the fortnight in raw material, both for export and to the smelters, and we close with marked improvement, indicating that with easier money a much healthier state of things may be witnessed than has existed for some time. The shipments advised by the mail on June 17 from West Coast, and just arrived, are not heavy, only representing 650 tons pure copper. Those for April amounted to 4025 tons, and for May 3221 tons pure copper—the estimates for the second quarter, of 270,000 quintals or 12,250 tons, which we gave in our report of the 16th ult. being confirmed. Sales since our last—

July 17.—25 tons Ingots, Urmeneta, ex Paracca £78 10 0 per ton.

July 19.—20 tons bars, ex Urmeneta, ex Paracca 77 0 0 per ton.

July 20.—12 tons bars, ex Annis Worrall 75 0 0 per ton.

July 24.—226 tons bars, at Swansea, ex Colorado 73 10 0 per ton.

July 24.—174 tons bars, at Swansea, ex Pembroke Castle 73 10 0 per ton.

July 25.—550 tons ore, on spot here, ex Contest 0 13 6 per unit.

July 25.—200 tons bars, at Swansea, ex Pembroke Castle 74 0 0 per ton.

July 25.—207 tons Ingots, at Swansea, ex Pembroke Castle 78 0 0 per ton.

July 25.—129 tons Ingots, at Swansea, ex Colorado 78 0 0 per ton.

July 25.—261 tons Ingots, at Swansea, ex Beta 78 0 0 per ton.

July 25.—10 tons Ingots, on spot here, ex Limena 78 0 0 per ton.

July 25.—2 tons Ingots, on spot here, ex Fusiller 78 0 0 per ton.

July 25.—1200 tons ore, Moonta, at Swansea 0 13 4 $\frac{1}{2}$  per unit.

July 26.—26 tons bars, at Swansea, ex Pembroke Castle 74 0 0 per ton.

July 26.—174 tons bars, at Swansea, ex Beta 74 0 0 per ton.

July 26.—593 tons ore, at Swansea, ex Coquimbana 0 13 6 per ton.

July 26.—600 tons ore, at Swansea, ex San Jose 0 13 6 per ton.

July 27.—250 tons bars, at Swansea, ex Beta 74 0 0 per ton.

July 27.—448 tons regulus, at Swansea, ex San Fernando 0 14 0 per unit.

July 27.—459 tons regulus, at Swansea, ex Epsilon 0 14 0 per unit.

July 27.—167 tons regulus, at Swansea, ex Pathfinder 0 14 0 per unit.

July 27.—255 tons regulus, at Swansea, ex Ismay 0 14 0 per unit.

July 27.—110 tons regulus, at Swansea, ex Delta 0 14 0 per unit.

July 27.—29 tons ore, at Swansea, ex M. A. Holman 0 14 0 per unit.

July 27.—106 tons ore, at Swansea, ex San Fernando 0 14 0 per unit.

July 27.—598 tons ore, at Swansea, ex Venezuela 0 14 0 per unit.

July 27.—330 tons ore, at Swansea, ex Black Watch 0 14 0 per unit.

July 27.—127 tons ore, at Swansea, ex Delta 0 14 0 per unit.

July 30.—308 tons ore, at Swansea, ex Delta 0 14 0 per unit.

July 30.—58 tons regulus, on spot here, ex Polestar 0 14 0 per unit.

Arrivals from the West Coast, S.A. \*

Ores. Regulus. Bars. Ingots. Barilla.

Collina, Africa ..... — ..... — ..... 15

Ann Cheshyre, Lota ..... — ..... 35 ..... 37 ..... —

Atahualpa, Lota ..... — ..... — ..... 110 ..... —

Alice, Carrizal ..... — ..... 500 ..... — ..... —

Contest, Chanaral ..... 550 ..... — ..... — ..... —

At Swansea—Edgar, Chanaral, 115 ..... 586 ..... — ..... — ..... —

Beta, Guayanac ..... — ..... 426 ..... 261 ..... —

Gamma, Caldera ..... — ..... 688 ..... — ..... —

G. Grenfell, Caldera ..... — ..... 6! ..... — ..... —

Wm. Leckie, Pena Blanca ..... — ..... 620 ..... — ..... —

Claudine, Caldera ..... 163 ..... 515 ..... — ..... —

Jessie Stowe, Taital ..... 845 ..... 475 ..... — ..... —

San Jose, Caldera ..... 604 ..... — ..... — ..... —

Dorsetshire, Carrizal ..... 119 ..... 340 ..... 52 ..... —

Chelydra, Tongoy ..... 490 ..... — ..... — ..... —

Stock of copper produce (Chilian and Bolivian) in first and second hands likely to be available—

Ores. Regulus. Bars. Ingots. Barilla.

Liverpool ..... 2042 ..... 3735 ..... 2335 ..... 523 ..... 68

Swansea ..... 8747 ..... 7925 ..... 374 ..... — ..... —

Quotations are 14s. for ores and regulus, 7d. to 7s. 10s. for bars, 7s. for Ingots, and 1s. 9d. to 1s. 6s. for Barilla, nominally.—P.S. The Pride of the Thanes has arrived with 500 tons bar copper.

**CHEAP FIRST-CLASS WAREHOUSE IN THE HEART OF THE IRON TRADE.**—It is 75 feet long by about 30 feet wide, and possesses the great advantages of good back light and two entrances.—Apply on the premises, 26, Martin's-lane, Cannon-street, City; or to Messrs. DEBENHAM, TEWSON, and FOWLER, 80, Cheapside.

#### British Association for the Advancement of Science.

**BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.**—The NEXT ANNUAL MEETING of the Association will be HELD at NOTTINGHAM, on WEDNESDAY, August 22, and the following days, under the Presidency of W. R. GROVE, Esq., Q.C., F.R.S., &c.

Notices of Papers proposed to be read should be sent to the Assistant-General Secretary without delay.

Information concerning the local arrangements may be obtained from the local secretaries at Nottingham (Dr. Robertson; E. J. Lowe, Esq., F.R.A.S.; Rev. J. F. McCallan).

GENERAL SECRETARY—Francis Galton, Esq., F.R.S., 42, Rutland-gate, London.

ASSISTANT-GENERAL SECRETARY—George Griffith, Esq., 5, Park Villas, Oxford.

GENERAL TREASURER—W. Spottiswoode, Esq., F.R.S., 50, Grosvenor-place, London.

#### Royal Cornwall Polytechnic Society.

**THE THIRTY-FOURTH ANNUAL EXHIBITION** of the ROYAL CORNWALL POLYTECHNIC SOCIETY, for the ENCOURAGEMENT OF SCIENCE AND THE FINE AND INDUSTRIAL ARTS, will be HELD in the Society's Hall, FALMOUTH, on FRIDAY, September 14, 1866, and SIX FOLLOWING DAYS. Silver and other Medals and Money Prizes will be awarded in the following departments:—viz., Mechanical, Naval Architecture, Professional Fine Arts, Photography, Statistics, Plain and Fancy Work, School Productions, &c.

Inventors, Manufacturers, Artists, and others who may be desirous of exhibiting are requested to communicate with the Secretary. Any further information that may be desired as to time, rules, transit of articles, list of prizes and premiums, &c., will be forwarded on application. No charge for space.

Space or insertion in the Catalogues or Judges' Books cannot be guaranteed after Saturday, Sept. 8. Communications should be addressed to Mr. SYDNEY HODGES, Secretary, Polytechnic Hall, Falmouth.

July 23, 1866.

**BARYTA COMPANY (LIMITED).**—By order of the Directors, NO FURTHER APPLICATIONS can be RECEIVED FOR SHARES.

**THE WORTHING MINING COMPANY (LIMITED).**—Notice is hereby given, that the ORDINARY GENERAL MEETING of the shareholders in this company will be HELD at the offices, 29, St. Helen's-place, Bishopton-street, London, E.C., on MONDAY, the 13th day of August next, at Two o'clock in the afternoon precisely, to receive the report of the directors and the accounts and balance-sheet for the past year, to elect directors and auditors, and to transact the ordinary business of the company.

By order of the Board, W. J. LAVINGTON, Secretary.

**ANGLO-BRAZILIAN GOLD COMPANY (LIMITED).**—Notice is hereby given, that the THIRD ORDINARY GENERAL MEETING of the company will be HELD at the London Tavern, Bishopton-street, in the City of London, on TUESDAY, the 7th day of August, 1866, at One o'clock precisely, for the transaction of the business of the company, including the election of auditors.

By order of the Board, JOHN E. DAWSON, Secretary.

**PORTABLE STEAM-ENGINES (SECOND-HAND) FOR SALE.**

—TWO 20-horse, by ROBEY, of Lincoln; TWO 10-horse, by CLAYTON, SHUTTLEWORTH, and CO., and a 7-horse; also a 10-horse RETURN FLUE ENGINE; and also FOUR OTHER ENGINES, out of repair, which will be disposed of at a moderate price.—For particulars, apply to MEAD and CO., No. 2, King's Bench-walk, Temple, E.C.

**STEAM ENGINES FOR SALE**—60-inch PUMPING ENGINE equal beam, 10 ft. stroke, with TWO 10-ton BOILERS; 36-in. CYLINDER SINGLE-ACTING ROTARY ENGINE, 14 ton fly-wheel, with 9-ton BOILER; 18-in. CYLINDER DOUBLE-ACTING ROTARY ENGINE, with drawing gear, wharfage, and 7-ton BOILER, the whole in good condition, to be seen at Kelly Bray Mine, Callington, Cornwall.—For further particulars and price, apply to Mr. EDWARD KING,

## WATSON AND CUELL'S MINING CIRCULAR.

WATSON AND CUELL,  
MINING AGENTS, STOCK AND SHARE DEALERS, &c.  
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

MESSRS. WATSON AND CUELL having made arrangements for transferring their weekly Circular, which has had so large a circulation during the past ten years, to the columns of the *Mining Journal*, their special reports and remarks upon mines and mining, and the state of the share market, will in future appear in this column.

In the year 1843, when Cornish mining was almost unknown to the general public, attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. J. Y. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring success in the aggregate," and Messrs. WATSON and CUELL have always a selected list on hand. Perhaps no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and share dealing than there is at present; and, from the lengthened experience of Messrs. WATSON and CUELL they are emboldened to offer, thus publicly, their best services to all connected with mines or the market, as they have for so many years done privately, through the medium of their own Circular.

Messrs. WATSON and CUELL transact business in the purchase and sale of mining shares, and other securities, payments of calls, receipt and transmission of dividends, obtaining information for clients, and affording advice, to the best of their knowledge and judgment, based on the experience of more than 30 years active connection with the Mining Market.

Messrs. WATSON and CUELL also inform their clients and the public that they transact business in the public funds, railway, docks, insurance, and every other description of share dealt in on the Stock Exchange.

Messrs. WATSON and CUELL are also daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

Messrs. WATSON and CUELL having agents and correspondents in all the mining districts, and an extensive connection among the largest holders of mining property, have the more confidence in tendering their advice on all matters relating to the state and prospects of mines and mining companies, and are able to supply shares in all the best mines at close market prices, free of all charge for commission.

PRINCE OF WALES.—It is very gratifying to us to find that the reports of independent agents, who went underground as soon as the water was out on Saturday last, fully confirm all the statements made as to the value of the lode, and the great prospects of the mine. Mr. Hitchins, who was first underground, valued the lode in the 45 west at 30/- to 40/- per fathom, and yielding magnificent ore. He adds—"I am satisfied that our prospects are daily improving, and that the lode will make not only in length but in depth. The engine I am quite satisfied with, and so were all those who saw it, and on its moving off in public that discerning body made the whole place resound with cheers." Other agents value the lode at 40/- per fathom, and it is being driven for 5/- per fathom. The engine forced the water with ease in 30 hours, and is capable of carrying the mine down 100 fathoms. An independent agent, who had never seen the mine before, went underground for us this week, and valued the 45 east the same as other people; he also thinks the 45 west will be found equally good between the cross-courses. He considers the north lodes will be found productive; and adds—"You have here, most undoubtedly, a very valuable mining property." Of course there will be fluctuations in shares, but the firm belief that those who hold the longest will get the most money, we refuse 2000/- on Monday for 1000 shares. When there are no orders on the market to buy, the quotations are put down, and when the public see them falling, they think there must be something wrong, and telegraph up to sell. This causes further flatness, and enables the "bears" to make money, and now that there can be no doubt as to the value of the lode the cry of the "bears" is that it is too rich to last. We wish the same could be said of many other mines we could mention.

NEW EAST RUSSELL.—"A."—We hope to see this mine turn out another Prince of Wales; but we cannot answer the questions asked this week. The shares are held in few hands, and we cannot name the price at present.

"R. E."—We believe the agents are expecting a great improvement.

THE BARYTA COMPANY, AND THE MINES PURCHASE AND FINANCE COMPANY (Limited).—The holders of more than half the capital of the latter company having since last week appealed to the directors not to sell the Baryta Quarry, but to work it themselves, they have consented to do so, and it is now in operation. The directors themselves had always a wish to adopt this method, having ample working capital, and the quarry bids fair to make immediate and very large returns. Those who applied for shares in the Baryta Company will have their money returned in full.

GREAT RETALLACK.—At the present moment there is not a better speculation anywhere than this, and we should be glad to join parties in buying it up, and erecting an engine, which could be had very cheap just now. The lead lode is as promising as any at the depth in the Chiverton district. In June the mine sold 89 tons of blende, and in July 97 tons. Immediate steps will be taken to forfeit all shares in arrear of calls, so that those who have paid regularly shall have the benefit of the present discovery.

## MINING, METALS, AND MINERALS—PATENT MATTERS.

By M. HENRY, Memb. Soc. Arts, Assoc. Soc. Eng.

The following Provisional Protections have been applied for during the past week:—On July 25, No. 1926, SELWYN, Tring, shaping metals; No. 1933, LIVSEY, Westminster, refining cast-iron; No. 1934, BROOMAN (communication from Bernabe, Paris), rendering armour-plates inoxydable; No. 1938, NEWTON (communication from Savage, West Meridian, U.S.A.), converting iron into steel, and plating, hardening, and tempering iron and steel.—July 30, No. 1962, PICKERING, Stockton, hot-blast.

The following have lodged Notices of Intention to Proceed with their applications for patents:—No. 821, NAYLOR, preventing smoke; No. 832, DALBY, cutting coals and minerals; No. 1442, MARCAIS, treating slags, ores, and compounds of tin. The last-named application, the provisional specification of which was drawn by Mr. Henr., patent agent, Fleet-street, relates to a treatment of compounds of tin; but as the final specification will not be open to the public till next November, reference to the application must for the present be restricted to a mere mention of the subject matter of the title.

The following appear among sealed Patents:—

No. 226, ROBERTSON, Glasgow, excavating, dredging, &c.—No. 320, LUCY, Liverpool, fastening balz-bands.—No. 911, NOAKE, Wolverhampton, iron safes and strong boxes.

The following Specifications have been recently printed:—

No. 2363, NEWTON (communicated from Wardell, United States), for cutting stone. He describes a machine moving on a rack, and carrying reciprocating cutters, supported in standards outside the carriage. He combines two or more cutters, connected by head and foot clamps, and sliding between guides supported outside the frame. The out-side standard may be hinged to some part of the frame, so as to be opened or closed. The cutters are actuated by straps worked by a vibrating beam. Serrated cutters-claims may be combined with serrated head-clamps. There are various other claims in the specification.—In specification of patent, No. 2350, Messrs. BELL, of Plaistow, describe apparatus for calcining and roasting copper and other ores and substances containing sulphur. A rotary retort is employed. This retort is set in an inclined position in a chamber, and it is heated; the ore descend, and become turned over in the retort, so as to present continually fresh surfaces to the action of air caused to pass through the retort, the lower end of which passes through the chamber, and delivers into another chamber with an inclined floor; the upper end of the retort communicates with a sulphuric acid chamber.—COPPER and SIEMENS, No. 2391, have filed a provisional specification for separating dust from gases, by causing them to travel very slowly, say at the rate of 1 foot per second, through a very large tube or box, with shelves or trays placed closely together. This application has not been proceeded with.—WOISSAM, No. 2382, describes a mode of consuming furnace-smoke, by a tube or cylinder in front of the furnace over the fire, having at one end a fan-shaped casting, or hollow body, and fitted with steam-pipes.—THOMPSON, No. 2411, specifies a mode of dressing and smoothing stones without cutting-tools, by placing them in cages, and causing them to revolve in opposite directions but in contact.—WATKIN, No. 2405, describes the use in furnaces of a tube open to the air, and fixed to a second tube opening into the furnace, air being injected by and with steam.—BOFFEY and SMITH, No. 2480, specify a mode of coating metal surfaces by a composition of whiting (or, as it is mostly called, whitening), mastic, and linseed oil—white lead being sometimes used in the composition.—ADDENBROOKE and MILLWARD, No. 2507, specify the collecting of gases of furnaces, by an arrangement of openings, which draw them off from the exterior of the circle or neck, so as to obtain a greater area.—BROADBENT, No. 2583, describes a safety-apparatus for cages and hoists, in which he proposes to apply to each side of the uprights a weighted eccentric, jointed to studs fixed to the stave, and connected by adjustable links to chains attached to the rope; the strain on the chains will hold the eccentrics clear of the guides, but if the rope or chain should break, the eccentrics will be brought into contact with the guides, and bind them. The surface of the eccentrics may be serrated.—HUGHES, No. 2523, specifies apparatus for shaping metals, by means of rolls, with sliding sectors or segments, for obtaining intermittent motion of the article to be treated, which is presented to the rolls at the smallest possible radius. He also describes certain peculiar cutters, and a mode of arranging rolls in eccentric-gear bearings, in connection with a revolving swivel-grip.—He further claims rolls with graduated or cammed working or pattern surfaces.—SALISBURY's specification, No. 2527, filed by Mr. Henry, patent agent, Fleet-street, is for producing and combining gases for heating purposes, by using the gases of oil, water, and air, or of oil and water only, in combination with gases obtained from the fires of ordinary furnaces. He also describes a retort for generating gases, and a tubular retort, composed of an inner and an outer perforated tube. He constructs great a series of such tubular retorts. He likewise specifies a bent retort, with two legs or limbs.—SALISBURY has also taken a patent, No. 2528, the specification of which, filed by Mr. Henry, patent agent, Fleet-street, refers to blast-furnaces, in which are used blasts or currents of gases of oil, water, and air combined. He also claims blasts or currents of heated lime-water vapour, and likewise the use of return passages for converting gases from the furnace back to its lower part, and passing them again and again through the furnace.

IMPROVED MOTIVE-POWER FROM GAS.—A very compact gas engine, the invention of Mr. PIERRE HUGON, of Paris, has just been set to work in London, for which several important advantages are claimed. The fact of the engine being protected by 12 patents, dating from 1858 onwards, is itself a guarantee that the inventor has been regardless of labour in perfecting it. A series of careful experiments has been conducted by Prof. Cazin, of the Versailles Lyceum, and the results obtained were highly satisfactory. The cylinder of the new machine is vertical, and a rod jointed to the shaft works a bellows, which draws the gas from the ordinary supply pipes, and forces it into the cylinder, where it is mixed with the necessary quantity of air to form an explosive compound, a minute quantity of water being supplied within the cylinder to ensure the necessary degree of moisture to prevent the hardening of the oil used for lubrication. The ignition of the explosive mixture takes place alternately above and below the piston, and is effected by an ingenious form of slide-valve carrying suitable gas-burners, which are lighted at each half-stroke by an exterior burner continuously kept burning. The cylinder is surrounded by a water-jacket, through which cold water is continually circulated. The explosive mixture used consists of about one part gas to nine parts air, and the average of the two experimental tests, each of one hour duration, made by Prof. Cazin on Dec. 6 and Dec. 8 respectively, showed the gas used in the cylinder to be 171 cubic feet; number of revolutions of shaft, 3313; weight on break, 15 kilos; length of break-lever, 2 metres; diameter of cylinder, 13 inches nearly; stroke, 11-8/10ths inches. The power of the machine was found to be 2½ horse power nearly, and the gas used per horse power per hour 74 cubic feet. It is claimed that Mr. Hugon's is the only gas-engine that regularly and uninterruptedly works up to its nominal power, and it is maintained that the ignition

## NOTICES TO CORRESPONDENTS.

\*\* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt: it then forms an accumulating useful work of reference.

JORDAN'S COMBINATION STEAM-BOILER.—I read with much interest the letter of your correspondent, "D.," in the Journal of July 14, on "Jordan's Combination Boiler," and also the article in last week's Journal, on the same subject; and I should esteem it a great favour if any of your correspondents would inform me whether the invention has been so fully tried as to establish its success, and where boilers, constructed on this principle, can be seen in actual operation?—ENGINEER.

CHAIN-PUMPS.—Will any of your readers, through the medium of your columns, inform me what main difference there is existing between Murray's chain-pumps and those lately patented by Bastier, with the advantages and disadvantages of each; and also, if possible, the results obtained by each, in any trials that may have been made, and any particulars relative to the cost of erection, motive-power, &c.?—E. G. S.

WEST WHEAL KITTY.—I observe a great improvement is reported in this mine, and I should feel much obliged if any of your readers would inform me to what extent this property has been already opened, what produce it has yielded, and what are its present position and prospects?—INQUIRER.

PRINCE OF WALES.—As many of your readers have an idea that the advertisement respecting the Prince of Wales, and signed "A Cautious Man," was sent to the Journal by me, I hope you will allow me a few lines to state that your original "Cautious Man" is not the author of it.—WM. H. HALSE.

THE MINING JOURNAL,  
Railway and Commercial Gazette.

LONDON, AUGUST 4, 1866.

Notwithstanding the dearth of money, and the peculiar position in which all financial matters are placed by the perseverance of the Bank of England to maintain a 10 per cent. rate for discount, the shipping trade of the country continues to expand itself most marvellously, and if this result be in the face of such adverse circumstances, it seems difficult to calculate what would be the extent of our export business if money were cheap and discounts easy. The Board of Trade returns show that the exports of the United Kingdom for the six months ending June 30 amounted in value to 92,857,830/-, whereas for the same period of last year the total was 74,128,633/-, giving an excess of 18,729,197/- for the half-year of 1866 over 1865, and is equivalent to an increase of 37,458,394/- for the twelve months, although for the month of June, by itself, the total was only 14,630,120/-, or 1,403,058/- in advance of June, 1865, and equal to 16,836,696/- for the year.

In articles identified specially with the mining industry of the country there is a decrease under only three heads, and an increase in the all the rest: the aggregate value of these exports being no less than 17,380,245/- against 15,461,918/- for the first six months of last year, and giving a balance excess of 1,918,327/- The decrease consists of machinery to the extent of 543,357/-; copper, 192,378/-; and tin unwrought, 16,273/-; whereas the increase is thus made up:—Iron, 1,569,193/-; coal and culm, 361,758/-; tin-plates, 230,314/-; steel, 224,773/-; hardware and cutlery, 142,740/-; lead, 115,533/-; zinc, 20,226/-; and brass, 5798/- If the remaining six months of 1866 keep pace with the first half, the total exports of the kingdom will approach the gigantic sum of 185,000,000/-, and of this about 35,000,000/- will be represented by mining and its results, than which nothing can be better evidence of the importance which attaches itself to this branch of trade, and the success which attends mining when legitimately pursued.

The dealings in the precious metals have been greatly in favour of this country. The exports for the six months amounted to 11,122,561/-, while the imports were 16,603,137/-, giving a balance to our credit of 5,480,576/- The excess of exports over imports, in respect to eight countries, was 7,331,447/-, while the excess of imports over exports, in respect of eleven countries, was 12,812,023/- The imports consisted of 12,427,886/- in gold and 4,175,251/- in silver. The exports were 7,355,854/- in gold, and 3,766,707/- in silver, so that our balance of credit for the six months was 5,072,032/- in gold, and 408,544/- in silver.

THE SELECT COMMITTEE ON MINES.

We publish in the Journal of to-day the conclusion of the evidence taken by the Select Committee of the House of Commons, appointed to enquire into and report upon certain allegations contained in a petition to Parliament, signed by nearly 20,000 working miners. The Committee have had 29 sittings, and have sat, on an average, nearly four hours per day. The result of their diligence has been the collection of a vast amount of evidence, which will form a bulky Blue Book, to be presented to the House before its rising. No fewer than 14,519 questions were put to the witnesses, and answered, in many cases, with an abundance of qualification and amplification; besides which, a very considerable number of documents have been put in, and ordered to be printed in an Appendix. The several members of the Committee have, doubtless, made up their minds, as the evidence has progressed from day to day, upon the several points at issue; and many of them, by their questions, have indicated what their conclusions are. It is also abundantly manifest that a very considerable difference of opinion exists; and no one is surprised that they have deferred their report to the House until the next session.

Without anticipating what that report will be, we propose in the Journal of next week to give a brief resume of the bearing of the evidence upon the points at issue.

The arrangement and production of the evidence given on the part of the owners and managers were directed by Mr. DAY, secretary, and Mr. MACKALL PEACE, solicitor to the Miners' Association of Great Britain, who watched the evidence with the greatest care, and continually supplied the members of the Committee with questions on points respecting which their own knowledge did not appear sufficient to enable them to elicit the truth. Mr. M'DONALD and Mr. NORMANSELL, who represented the workmen's Unions, were also present at each sitting, and were frequently allowed, by favour of the Chairman, to put in counter-statements to those of witnesses brought forward on the part of the masters; and it must be admitted they performed their duty to their clients with fidelity, intelligence, and zeal.

IMPROVED MOTIVE-POWER FROM GAS.—A very compact gas engine, the invention of Mr. PIERRE HUGON, of Paris, has just been set to work in London, for which several important advantages are claimed. The fact of the engine being protected by 12 patents, dating from 1858 onwards, is itself a guarantee that the inventor has been regardless of labour in perfecting it. A series of careful experiments has been conducted by Prof. Cazin, of the Versailles Lyceum, and the results obtained were highly satisfactory. The cylinder of the new machine is vertical, and a rod jointed to the shaft works a bellows, which draws the gas from the ordinary supply pipes, and forces it into the cylinder, where it is mixed with the necessary quantity of air to form an explosive compound, a minute quantity of water being supplied within the cylinder to ensure the necessary degree of moisture to prevent the hardening of the oil used for lubrication. The ignition of the explosive mixture takes place alternately above and below the piston, and is effected by an ingenious form of slide-valve carrying suitable gas-burners, which are lighted at each half-stroke by an exterior burner continuously kept burning. The cylinder is surrounded by a water-jacket, through which cold water is continually circulated. The explosive mixture used consists of about one part gas to nine parts air, and the average of the two experimental tests, each of one hour duration, made by Prof. Cazin on Dec. 6 and Dec. 8 respectively, showed the gas used in the cylinder to be 171 cubic feet; number of revolutions of shaft, 3313; weight on break, 15 kilos; length of break-lever, 2 metres; diameter of cylinder, 13 inches nearly; stroke, 11-8/10ths inches. The power of the machine was found to be 2½ horse power nearly, and the gas used per horse power per hour 74 cubic feet. It is claimed that Mr. Hugon's is the only gas-engine that regularly and uninterruptedly works up to its nominal power, and it is maintained that the ignition

of the explosive mixture by a gas-jet instead of by electricity is decidedly advantageous, inasmuch as electricity is a force too complicated and too delicate for the every-day use of a manufactory or workshop. Gas-engines are, undoubtedly, the best motors extant for obtaining small power—from ½ to 3 horse—without the necessity of the continual outlay which the use of steam would entail. No expense whatever is incurred whilst the machine is idle, and the full power is available at any moment by simply lighting the gas, whilst its stoppage is effected with equal facility by turning it out.

TREATING TIN ORES AND TIN SMELTERS' SLAGS—IMPORTANT TO TIN MINERS.—It frequently happens in the treatment of the tin ores produced in Devon and Cornwall that loss is incurred by the miners, not because the ore does not contain sufficient tin to render it valuable, but because that tin is associated with other metals and substances, the separation of which is extremely difficult and costly. An invention, however, has just been patented by Mr. M. Henry, of Fleet-street, by the application of which all descriptions of tin ores can be treated with equal facility, and all the products contained can be extracted at a mere nominal cost, and in a readily marketable form. The inventor is Mr. J. J. Margais, of Paris, who claims that by a simple process, which he has tested on a large scale, he can extract the whole of the metals contained in tin ores, or the scoria from tin-smelting works, at an enormous profit. Wolfram, and the other impurities usually so extremely annoying to the tin miner, becomes saleable articles, and their presence occasions no inconvenience whatever, whilst the invention has the additional advantage that, when applied to the ores of tin, the greater part of the dressing processes may be dispensed with, the treatment directly following the stamping. Mr. Margais intends to offer to treat the vast heaps of scoria now lying about the smelting-works upon condition of receiving a proportion of the profits realised, and as the material which he proposes to treat is at present absolutely worthless to them, it will certainly be to the interest alike of the miners and of the smelters to offer every facility for the introduction of the process. As soon as the patent is completed, a detailed description of the invention will be published.

COPPER MINES, AND THE COPPER TRADE.—Although at present the price of copper is lower than it has been for many years, it is beyond question that by more careful manipulation of the ores copper mining may still be made extremely profitable. It has too long been the custom of mine adventurers, especially in Cornwall and Devonshire, to neglect all ores that required any other treatment than mere crushing and washing, and hence enormous masses of ore have been permitted to accumulate as refuse, which, if now treated, would enable many mines to pass over the present period of depression without making calls upon their shareholders, and without restricting the proper exploratory works for opening out the mine. Certainly nothing is better calculated to assist the miners until the price of copper rises (and considering that the last published Board of Trade returns show most satisfactory increase in the exports of that metal, as compared with the corresponding month of last year, there is good evidence that the existing depression is temporary only) than the extraction of the metal from the ores now considered worthless. The large profits attending this branch of the miner's business is evident, from the extraordinary success which has attended the operations of the Alderley Edge Mining Company, which, although the average produce of their ore was scarcely 1½ per cent., declared a dividend of 40s. per share, on Tuesday, and are altogether in a most prosperous condition. The company has been in operation

that the bore-holes were kept sufficiently in advance, while the latter delegated this duty to the underlooker or fireman, Mr. Stott again said that he could not plead guilty to the charge of negligence.—The very mitigated penalty of 20s. and costs was imposed.

### THE SELECT COMMITTEE ON MINES. HOUSE OF COMMONS, JULY 19.

Present: Mr. NEATE (in the chair), General DUNNE, Professor FAWCETT, Mr. GREENALL, Mr. KINNAIRD, and Mr. LIDDELL.

Mr. THOS. WYNNE, Inspector of North Staffordshire, Shropshire, and Cheshire, said that he visited collieries (but not as a rule) without information. Had been an Inspector nearly 15 years, and there were, perhaps, 30 or 40 out of the 300 collieries in his district which he had never visited. There had been no accident and no complaint in them.

By the CHAIRMAN: I inspect when I think it likely danger may exist. For instance, I go very often to the deep pit at Dukinfield, because I am very much dissatisfied with the management. I have been down there 20 times, I should think. I do not consider there is efficient management there, I am not speaking of the pit where the recent accident occurred, but of the Astley pit. It is of unusual depth—686 yards. I was induced to go there before I knew anything special about it, on account of its great depth. Collieries of unusual depth require more than usual precautions. I think myself able to discharge all the duties of my office, as far as my ideas of the duties go. If I went further than I now go, I should be taking upon myself a responsibility that does not belong to me. I do, however, think that more frequent inspection would tend to better management; although there would be a danger, on the other hand, of the proprietors looking rather to the visits of the Inspector than their own good management. I mean, that if I made no complaints they would assume that everything was right. I was present at the inquest arising from the late Dukinfield accident. I had not visited that pit for two years. When I was there they had not very long commenced opening it, and at present there is no large extent opened. It is a very small colliery even now. I went over every part of it at the time of the inquest. There was no defect that was likely to have been prevented if I had been there a short time before. I do not think any inspection on my part would have prevented that accident, because it arose from what it never could be supposed anyone could do. It arose from gross neglect on the part of the management. The mischief was in some workings that had been opened about three years before, and had been left standing; workings I should not have thought of visiting, if I had gone down the pit the day before the accident.

Mr. LIDDELL: Were they abandoned workings?—No; they were driven out; but there were no means of getting the coal away. The dip is about 24 inches in a yard, and the pit not having been sunk as it ought to have been, they were 200 yards down below the level of the bottom of the pit.

The CHAIRMAN: Why should you not have visited these disused workings?—because there was no reason to infer danger; they were out of the course of all the workings that had been going on for two years at least. Gas was not likely to accumulate there, if proper management had gone on.

The CHAIRMAN: What do you mean by "proper management"?—The air being sent round. No one would have supposed but that what place was ventilated. It is impossible to find time to visit disused workings, and in point of fact it would be impossible from other causes. We go to the entrance of disused workings, and see that plenty of air is going through; but if that air were not properly applied it could not do its work. There may be odd corners in disused workings through which the air does not pass, and that was exactly the case in this instance. Without going through, I should never have supposed for one moment that place was full of gas.

By Prof. FAWCETT: If I had visited the mine it is just possible I might have thought the new workings to be in dangerous proximity to the old ones, but the chances are that I should not have done so. The management of these pits was bad. No mine that ever I have visited has been in so bad a state.

Prof. FAWCETT: You said you made your first inspection when the mine was just begun, and did not make another till the accident happened; if you had visited the mine during that time should you not have discovered that the management was bad?—I should.

Prof. FAWCETT: Without alluding to the particular circumstances which produced the explosion, if the mine had been more frequently inspected the general bad management would have been discovered, and probably the whole would have been improved?—I do not find the proprietors of mines are very much inclined to alter their management upon my representation. I have now four of the largest in my district which are managed by totally incompetent men, and all my representations seem to have no effect upon them.

Prof. FAWCETT: Did you represent to the manager of the deep pit at Dukinfield that it was badly managed?—I have done so; and I have written to the proprietor, to tell him I hold him personally responsible for what may happen.

Prof. FAWCETT: Have your recommendations there been attended to?—They were not.

Prof. FAWCETT: Have you not power under the Act to see that your recommendations are attended to?—The only power that we have is to give owners notice that danger is to be apprehended, and they have the power of going to arbitration. I intend to bring this case to arbitration if nothing is done. I wrote on June 23, and received an answer on the 28th, but it was unsatisfactory. I had visited the mine eight or nine months before I wrote, and it was then unsatisfactory, but the manager was leaving the colliery, and I could get nothing satisfactory from him. The owner is now the manager. It is a very heavy responsibility for a coalowner to incur, for an Inspector to give him notice that he is held responsible for anything that may happen.

The CHAIRMAN: Do you conceive that it is part of the duty of an Inspector to report to the owner that his manager is an incompetent man?—No, but if the state of the pit has been represented to the manager, and he does not seem to have the knowledge how to alter it, then I think it is the duty of the Inspector to let the proprietor know. I do not think I have ever gone so far as to report to an owner that his manager was an incompetent man, but I have reported that the management was defective. I will read a copy of a letter I sent to illustrate my practice. "I think it my duty to call your attention as the responsible manager of the —— Colliery to the unsatisfactory state of the ventilation in the —— pit. According to the returns of your own underlooker there does not appear to be more than 37,000 cubic feet of air per minute passing through the whole of the workings, which is not much more than half of what is required for the health of the men and the safety of the mine. I found several places in the pit in a very unsatisfactory state, and the colliery generally clearly shows the want of that supervision which a superior colliery viewer can alone impart to it. I shall be glad to have an acknowledgment to this letter, as I think it but right that the responsibility should rest with you and not with me." The answer I got to that letter was—"I beg to acknowledge the receipt of your letter, and in reply shall endeavour to improve the ventilation of our —— pit as you suggest. I think an impartial enquiry should be made as to whom the merit is due of the complete absence of explosion in our pits for the last 20 or 30 years." In answer to that I wrote—"It is not for me to go into an enquiry as to which of your many managers during the last 20 years the merit is due of preventing explosions in your colliery; but it is my duty to point out to you as its responsible manager that the ventilation is now totally inadequate to the requirements of such a mine, and tends to endanger the health and the lives of persons working therein." I am afraid no improvement will be produced, as that mine is, in fact, managed by an underlooker. I have a promise of improved ventilation, and I shall keep my eye on that mine. If nothing is done I shall employ all the powers the Act confers to compel a more satisfactory management.

By Mr. LIDDELL: I think the law of compensation as to mining accidents unsatisfactory. Neither judges, counsel, nor jury seem to understand a mining question when it comes before them as to the cause of death. I do not suggest a special court of law for trying mining questions; but I should recommend that coroner's juries there should be a medium course between verdicts of accidental deaths and manslaughter. If they could award a fine or dead and not exceeding £100 (with a power of appeal perhaps), I think that would have a very good effect, and I think it would work well.

The CHAIRMAN: You think that many accidents happen for which under the present law there is no adequate remedy, and for which compensation ought to be given?—I do.

Mr. LIDDELL: Do you think that the juries as at present composed are men to whom the power of assigning damages should be entrusted?—Unless in the case of serious accidents there is not that care bestowed which there would be under those circumstances. The present juries are chiefly of a class below shopkeepers. It is now inferred that there will be no important consequences attending the verdict, and therefore it does not matter so much who is on the jury. As far as my experience goes practical miners make the very worst juries; they are so very much prejudiced. The police, however, always take care to summon good jury if it is a serious accident. They make a point of that, and more pains are taken to get intelligent men upon it.

By Mr. GREENALL: I would not go beyond £50, even in the case of death.

Mr. JAMES PHILIP BAKER, Government Inspector of Mines for South Staffordshire and Worcestershire, said—I have held my present office nearly six years, and I think I am quite equal to the duty of inspecting that district as I think the Act requires it to be done, I do not think that for such an inspection as is contemplated by the Act any more Inspectors are required.

The CHAIRMAN: Do you think it would be desirable to extend the duties of the Inspectors?—That would depend entirely upon the question how far inspection ought to reach, whether it ought to be a perodical inspection of every pit, or some other kind of inspection. I hardly think that a more perfect inspection would tend to prevent accidents; for I am rather inclined to believe that in many cases the managers would become more lax in their discipline if there were more inspections, and that rather than remedy any evil or defect they would hide it out, and wait the arrival of the Inspector.

The CHAIRMAN: Must not the inspections be very frequent indeed before it could lessen the responsibility of the owners; would a visit once in six months remove the sense of responsibility from the managers?—It would tend that way. If an owner knew that the Inspector could come on a certain day, or at the end of six months, he would be better prepared for the visit than in the interval. As it is, the visits of Inspectors produce improvements in the management of the mines. I have about 540 collieries in my district, and during the six years I have been Inspector I do not think there is any colliery of any duration which I have not inspected, either above or below ground. I go without any special reason; my practice is to go to a colliery when I have leisure, and to inspect it, either above or below ground.

The CHAIRMAN: What do you mean by inspecting above ground?—The machinery and colliery plant, which is a very important matter in my district. I think my inspection has tended to lessen the accidents from the breaking of chains. About the year 1850 the loss of life in coal mines alone was about 200 per annum. For the 10 years subsequently the annual average was reduced to 162, while for the last five years it was only 113. The number of lives lost in my district last year was 91; and there never was a time when so much coal was raised, or so many persons employed. I attribute this decrease to better arrangements, both above and below, and to the Inspectors to some extent. Both owners and managers are more careful now than they were before the Inspection Act passed.

By Prof. FAWCETT: I suppose that I have not been down more than half the pits in my district. In the case of many of them I knew nothing of the manage-

ment from actual observation. In some collieries we have a large number of pits. In some that do not comprise more than 100 acres there are as many as 50 shafts. It is a fact that in regard to a considerable number of the collieries I have not been able to go underground, and see their workings. If there had been another Inspector, who could have taken a portion of my district, that number of collieries which have not been visited underground would necessarily be diminished. They might have been better known, but it is a question whether they would have been better managed. In cases where defects are really existing more frequent inspection would, probably, lead to better management.

By Mr. LIDDELL: We know pretty well by the character of the owners, and that of the persons they employ, whether a colliery is likely to be well or ill managed; and I do not think it necessary or desirable to inspect well-managed collieries to the same extent as those which are not so well managed. My practice, however, is this: I go and inspect all the collieries in my power when I have any leisure, and when there is any need. I should not refrain from going down any particular pit, however well the manager might be up to his duties, if I were in the district, and had leisure. But if there was a particular colliery in which I considered the management defective, I should continue to visit it until I got things put straight. I consider it to be part of my duty in such cases to continue to visit the colliery, and never let the owners or managers alone until they have carried out some improved system of operation. If a good pit bad management crept in I should be sure to get an inkling of the change for the worse. I occasionally receive anonymous letters, and I always either go at once, or if I cannot I send word to the owner. Of course, I do not tell him how I obtain the information—I should never think of doing that—but I say such and such a circumstance has come to my knowledge, and I request the writer, but I never let it be known from whom I received information. I do not like anonymous letters. I have travelled many miles, and have had many needless journeys through them, but that does not prevent me from paying attention to them when I do receive them. Many of the viewers, and some of the owners are uneducated men; but it is preferable—and particularly in the larger collieries—to have educated viewers. It enables him to enforce better discipline.

By Mr. GREENALL: The great source of accidents in my district is fall of roof and shaft accidents. Those from falls have greatly diminished, but those from accidents have not decreased in proportion. Explosions average about eight miles per annum. It is a foolish economy to employ an inferior management.

By Prof. FAWCETT: It is part of my duty to see the educational provisions of the Act attended to, and it requires a large proportion of my inspection. The boys as a rule in my district are not allowed to work under the age of 12 unless they can read and write, and when the law first came into operation many boys were dismissed. I regret to say that there is no useful advantage taken of the clauses by the workmen to send their boys to school, as there is a large demand for juvenile labour in other trades. With us the Act has done little good in this respect. The restriction ought to be binding on all trades to be of any real use.

By Mr. LIDDELL: I have not observed a tendency in my district on the part of the proprietors to employ inefficient men as viewers. I may have seen an instance or two where I should have liked to see a more experienced person in charge, but that is not general. I am not quite satisfied with the class of persons entrusted with the management of mines in my district, but I do not think owners have a desire to put in inferior men. I am not satisfied, because I do not find them all of equal ability. Skilled viewers, such as I should like to see, are not to be had in all cases. Lack of supply is one cause; but in my district there are a large number of small collieries, where a man may do very well who would not be capable of managing a large or a difficult mine. I believe accidents are fewer in proportion in the small mines than in the large.

By the CHAIRMAN: The average of safety is greatest in small mines, which, as a rule, are not so deep as the large mines.

Mr. FAWCETT: And that is the reason why there are fewer accidents in them?—When you have got a large colliery you have more to depend upon in regard to vigilance and care, but where you have a mine of small extent that amount of care is not requisite, because there is less chance of an accident than in a large mine. The witness then withdrew, and the CHAIRMAN announced that the Committee did not propose to take any further evidence. What they had taken would be presented to the House at once, but the Committee would not make their report until the next session of Parliament.—The proceedings then terminated.

### FOREIGN MINING AND METALLURGY.

We recently announced a tendency to improvement in the Belgian siderurgical markets; this tendency is considered to have since made a sensible progress. The hope of an early peace, which appears assured, has brought back confidence, and rolled irons can now be quoted at 67. 12s. per ton taken at the works. Some orders of a certain importance have been received this week in the Charleroi basin on American account; some of these affairs are attributed to the crisis prevailing in England. The Belgian market is not likely to experience the strike difficulties with which England has to contend; at any rate, not until a marked revival is witnessed in affairs; and the Belgian forgemasters are, consequently, anticipating further orders from America, which does not feel the effects of the war from which Europe is at present suffering. It is right to add that some Belgian houses now do business direct with the United States. The tax on foreign iron applied for by the Pennsylvania forgemasters may possibly affect adversely the new outlet which Belgium has obtained across the Atlantic. Pig continues to give way, especially as regards inferior qualities, which are quoted at 37. 16s. per ton. The position of the collieries in the basins of Charleroi and the Centre has experienced little or no change, prices remaining the same. Deliveries by railway continue to be made with great activity in the direction of France, and stocks are of little importance; navigation operations are about to be resumed in the Mons basin affairs continuing to sustain themselves on favourable terms, and, as the supply of labour is limited, there is no probability that stocks will accumulate as they have done during the dead season of former years. Prices have experienced no change, except as regards fine coal, which is in great demand. In the Liege basin the situation continues less favourable, and, although working operations are still actively prosecuted, stocks begin to form themselves; prices are, in consequence, less firm in this district. The Thy-le-Chateau Blast-Furnaces and Forges Company will meet to-day (Saturday) at Charleroi. The Marche and Couillet Company will meet Aug. 9, at Brussels. The Zone Forges Company will meet the same day, at Zone, near Marche. The last adjudication for plant required for the Belgian State lines presented scarcely any features of general public interest.

The Stolberg and Westphalian Zinc and Lead Mines and Foundries Company obtained in 1865, in the neighbourhood of Stolberg, two new concessions of iron minerals, named respectively Hauseit and Leienammer. Notwithstanding a want of workmen, the profits realised by the company's Stolberg Zinc Works, in 1865, were of a satisfactory character.

The Stolberg Lead Works continued to increase their production in 1865, notwithstanding the reduction in the deliveries from the Connemara Mines. The fabrication comprised 9638 tons of merchants' lead, against 9380 tons in 1864; and 2448 tons of silver, against 2398 tons in 1864. The sale was active last year, and as with zinc, so with lead, the company was enabled to sell beyond its total production part of the stock of the preceding year. The Ramsbeck Mines occupied during 1865, 791 miners and 308 labourers, or 22 miners and 129 labourers less than in 1864. The important reduction in the number of labourers which these figures disclose arose from the further substitution of machinery for manual labour. The sun devotus by the company in 1865 to the working of its mines was 202,065 thalers, or 7325 thalers less than in 1864. At the Dornberg Mine a shaft has been sunk below the Ludwig Stollen gallery to metalliferous bearings supposed to be situated in that direction. On the eastern side some fine lead minerals have been discovered. At the Aurora Mine works have been continued in the Andreas Stollen, Wilhelm Stollen, and Von der Heydt Stollen galleries, and below the last two pits have been sunk, in which veins of fine blende ore have been met with. At the Gieckesfand and Alexandre Mines the various galleries have been continued with much success. The Ramsbeck Lead Foundry last year treated 8180 tons of lead minerals, which furnished 164 tons of merchants' lead, 350 tons of litharge, and 1,973 ton of silver. These results, when compared with those attained in 1864, show an increase of 54 tons in the quantity of litharge produced, but a falling off of 422 tons in the production of lead, and of 6361 ton in the production of silver. The return price of the lead was about 21% per cent, above the return price of 1864. The Dortmund Zinc Works employed, in 1865, 226 workmen; it treated 13,636 tons of zinc minerals, which furnished 2316 tons of rough zinc. An ordonnance of the King of Prussia, dated July 18, 1865, approved certain modifications introduced into the statutes of the company.

We turn to France. In the basin of the Loire the forges have advanced their terms 8s. per ton, as regards merchants' iron and sheets. The committee of French forgemasters recently appointed a committee to establish a classified tariff for plates. A proposal emanating from Creusot has been taken as the basis of this work, and the committee, after having come to an understanding with all the forgemasters, has just published a tariff, which is expected to prove of great utility, as well to purchasers as to sellers. The new tariff has been adopted by most of the producing establishments, and its immediate application has been decided on. The salient principle of the new tariff is, that it proposes as a basis of operations that all plates shall be sold at the prices applicable to the most easily-selected samples or specimens, the rule adopted with regard to merchants' iron being thus followed. For plates of commerce and plates for pipes, which usually have sold by weight, and by a small number of dimensions adopted by custom, the classification is regulated according to the weight of the sheets referring to each of those dimensions. For construction plates the classification is made according to the dimensions of each sheet. At St. Dizier, charcoal-made pig is quoted by continuation at 47. 8s. per ton; half-coke made, 37. 16s.; coke-made, 37. to 37. 4s.; to 10s.; special iron, 8s. 4s. to 87. 12s.; machine No. 20, charcoal-made, 97. 12s.; mixed ditto, 97. 4s.; coke-made, 87. 16s.; hammered iron, 107. 4s. to 107. 12s., and ordinary axles, 107. 12s. to 107. 16s. per ton. A communication from the syndicate of Franche-Comté forgemasters says:—"The position of affairs among the group of Franche-Comté forgemasters revisited satisfactorily during the last few months of 1865. The first quarter of 1866 confirmed this state of affairs, and the prices, &c., of the Comté district—but especially the plates—were more easily run off than has been the case for some years past. Some establishments even advanced their tariffs 2 or 3 per cent.—In a word, the fall was stopped, and sale prices appeared likely to rise in a little while to a point which would leave some profitable results for the capital engaged. The political and financial events which have occurred during the last two or three months have naturally checked this revival in business, and the demand has become less active, especially for certain special plates, which find their principal outlet on the Paris market. At the same time it may be stated that at present the general current of affairs has continued good. Fine forged iron continues to be quoted at 167. 16s. to 177. 4s. per ton; fine rolled iron, 177. 12s. to 187. 8s. per ton, according to specimens; and superior fine plates, 234. 4s. to 247. 16s. per ton, according to a special classification in the Comté group. At the last quarterly meeting of the Comté forgemasters, at Besançon, first-mash pig was maintained at 167. 12s. 7d. per ton, delivered at the stations nearest to the producing blast-furnaces; this price might easily have been advanced, as there was a good demand and little stocks with which to meet it. Since then this situation has been maintained, and, according to information collected recently, pig is taken off as fast as it is produced. The next meeting of the Comté forgemasters will take place at Besançon towards the close of August, and it may be anticipated, unless a greater

perturbation arises in affairs, that the price of May will be maintained for pig. There may even be an advance in prices, as it is no longer doubtful that many establishments begin to recognise the fact that the superior coke-made iron, which some time since displayed a tendency to substitute itself more and more every day for the pig of the Comté district, cannot, although very good, be applied in a general manner to the whole fabrication of the Comté district. On the whole, the position of the Comté group is better than it has been for some years, and it would easily acquire more vigour and vitality if affairs generally regained a better tone, and presented more security." Meetings are announced as follows:—Mouzaia Mines Company, Aug. 9, at Paris; St. Eloi Collieries and Railway Company, Aug. 10, at Paris; Bonne Metallurgical Company, Aug. 11, at Paris; Strait Collieries Company, Aug. 13, at Paris; Palmée Collieries Company, Aug. 14, at Courcelles; and Longue-Ferrand Colliery Company, Sept. 6, at Elouges. The recent opening of additional sections has carried the length of line worked by the Paris, Lyons, and Mediterranean Railway Company to 2130 miles.

At Paris copper has fallen, in consequence of the reduction of prices in England, but the demand has not revived in consequence; English is quoted at 82*l.*, rough Chilian at 78*l.*, and Cocoroc mineral at 81*l.* per ton. On the Havre market Chilian has continued to provoke some affairs, purchasers coming forward rather pimerously at current rates; sales have been noted, with delivery at the close of August, at 78*l.* 10*s.* per ton. Paris conditions, and for the end of October at 7*l.* to 8*l.* In disposable transactions are more restricted, and have been effected at an average of 78*l.* per ton. The article has continued quiet on the German places; at Hamburg there have been few affairs, and prices have been nominal. At Cologne the demand has been very limited, and at

town, but, of course, this will only be of a temporary nature, and of limited duration.

Coals are steady in price, but in rather sluggish demand, and the quality is bad—coal heap, which has lain for, in some instances, 30 years, being brought into requisition owing to the scarcity of the article, and the continued determination of the colliers to refrain from working a full day's drudgery or a full week's work, under the supposition that if they did either they would thereby lose part of their day's or week's pay. The high price of coal is beginning to tell upon some branches of our staple manufactures, and the enhanced cost to some firms is as high as from 30/- to 100/- per week. The price of coal will thus affect the price of other commodities; and it may ultimately attain to such importance as to materially affect our power to export certain articles, and thus directly interfere with the revenue of the country. The shipments for the week to date are 28,500 tons, and in the same week of last year they were 35,700 tons.

Two meetings of miners have been held since my last, and the result of their deliberations is that if the masters would agree to a reduction of per day instead of 1s, they would offer no resistance, but if this is demanded it should be resisted—“uncalled for”; and in that event a work in each district was to be ballot for to go out on strike, the men employed by the masters who took a prominent part in the reduction being the first to be drawn.

The Great Northern Mining Company of Ireland, principally owned by parties in and around this city, have yesterday paid a dividend of 10 per cent., and another similar dividend of 10 per cent. is expected to be declared in a short time, the one being turned out in such quantities.

The great engineering work of throwing a railway bridge across the Solway Firth, between Annan and Towness, Cumberland, is making considerable progress, and the works upon the Solway Junction Railway, of which it forms a part, and which is to shorten the route from West Cumberland to Scotland by railway about 20 miles, is also being constructed rapidly. The report of the directors of the company for the past half-year states that a bill to authorise the extension of the line to Maryport having been thrown out in Parliament, they have made an amicable arrangement with the Maryport and Carlisle Company, securing to the Solway Junction Company the iron ore and other traffic to Scotland.

Several engineers are engaged surveying Caithness-shire, with the view of fixing on the route for a junction with the Sutherlandshire system.

At the Great Northern Mining Company of Ireland meeting, at Glasgow, on Tuesday, a dividend of 10 per cent. was declared to the shareholders, who are chiefly resident in and around Glasgow; and we are informed that so much ore is being raised from the mines that the directors will be able to declare a similar dividend on an early day. Mr. Colin H. Dunlop has been appointed to the office of secretary to the company.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

AUG. 2.—No change can be reported in the Iron Trade of this country. Recent failures have necessarily created anxiety, and tended still further to restrict transactions, and we must wait for some little time longer before we can hope for activity. It is satisfactory that the new banking company at Birmingham has been successfully launched, mainly on the basis of the former Birmingham Banking Company, being composed largely of its shareholders, who have purchased the premises, and who will thus be able to secure a good deal of the connection, and to make the best of the assets of the defunct company. It cannot but be that in winding-up the affairs of a bank which has failed from the inability of creditors to repay advances made to them that some collapses must result, but it may be hoped that none who have a *bona fide* prospect of repaying the advances made to them will be unduly pressed, and this is the utmost that can be done to mitigate the effects of such a collapse. The Midland Banking Company, which was formed mainly to take up the connection of the private bank of Sir Francis Goodrich, at Wolverhampton, held its half-yearly meeting on Friday, Mr. T. S. Richardson presiding. The report was very satisfactory. The net profits were £3,767/-, and the payment of a dividend at the rate of 6 per cent. left 2000/- to add to the reserve fund, 348/- to be applied to the reduction of the preliminary expenses, and 6829/- which included 3774/- for rebate of discount on bills not due—to be carried forward to profit and loss account. Mr. H. H. Fowler, who moved a vote of thanks to the directors, said that not a single shilling had been advanced to any director, which the general manager, Mr. Tomson, confirmed. The attendance at the meeting was numerous and highly respectable, and the general feeling one of confidence in the future prospects of the bank. The half-yearly meeting of the Railway Rolling Stock Company was held on Tuesday—Mr. J. Perks in the chair. The report was very favourable, and a dividend at the rate of 10 per cent. per annum was declared, and it was stated that the company had met with scarcely any appreciable loss during the half-year. The dividend of the Patent Shaft and Axle-Tree Company of Wednesbury, it is announced, will be at the rate of 15 per cent. per annum, with a large amount to carry forward. The directors of the Midland Wagon Company announce profits for the year amounting to £1,223/-, and recommend a dividend at the rate of 15 per cent., which will leave a large amount of profit to carry forward.

A terrible Boiler Explosion took place on Saturday at Mr. H. Williamson's Pinnox Colliery, near Tunstall, in North Staffordshire. The operations at the pit having been lately much extended, a very superior new engine, of 150-horse power, was fixed, and two new tubular boilers, 30 ft. long and 9 ft. in diameter, were made at the works to supply steam. They were constructed so as to be capable of bearing a pressure of from 50 to 60 lbs., but at the time of the accident only one was completed, and the engine was working with that alone, having begun on the previous Wednesday morning. The other boiler was fixed, but the fittings were not quite completed, and two men were at work inside it when the accident happened. On Saturday morning the night men had been raised and the day men lowered, the engine being under the charge of Stephen Chadwick. At half-past seven Mr. Josiah Dale, the engineer at the works, went into the engine house to see how the engine was working, and received a favourable report from Chadwick. He found that the indicator showed a pressure of 35 lbs. to the square inch, and the steam was blowing freely off at the valves. In half a second, however, the gauge had gone up to 36 lbs., and this attracted his attention and excited his surprise, as there had been found a difficulty previously in maintaining the pressure. In a moment or two the explosion occurred, the main part of the boiler, weighing about 12 tons, being carried through an embankment for 60 yards, and the other part, about 7 tons in weight, flew as far in the contrary direction. The destruction to the building was, of course, very great; but, still worse, Stephen Chadwick, who was standing at the fire-hole a moment before the explosion, was killed on the spot, and Abel Mayer was buried in the ruins, and died within an hour. Mr. Dale, the engineer, was injured, and a bricklayer, named Joseph Smith, very seriously, but they are recovering. The other boiler was unseated, and rolled over, and the men inside it hurt, though not very seriously. At an inquest opened on Monday Mr. Wynne, the Government Inspector of Mines, was present. The engine Josiah Dale, stated that the steam-gauge rose from 35 to 36 lbs. in less than a second, just before the explosion. There was a blow to show the height of the water, and a water-gauge, and, in addition, a whistle to indicate when the water was low, and the gauge showed the water to be  $\frac{1}{2}$  in. above the height at which the whistle would blow. He said he could not account for the explosion or the sudden raising of the pressure, but Mr. Wynne suggested that it might be explained if the fuses were bare of water, to which the witness assented, though he thought it highly improbable this could be the case. The inquest was adjourned until to-morrow, and, at the suggestion of Mr. Wynne, the Coroner consented to ask Mr. Longridge, of Manchester, to examine the boiler, and report as to the accident on that day.

A fortnight ago reference was made to a fatal colliery explosion at the Glebe Colliery, Fenton, North Staffordshire, by which four persons lost their lives. The adjourned inquest was held on Tuesday, and Mr. Wynne, the district Inspector, was present. The evidence showed an extraordinary amount of recklessness on the part of Thomas Briggs, who was sinking a shaft, and had three men working under him. Mr. Kelsall, the underground bailiff, having had reason from Briggs own information to suspect the existence of gas in the shaft, gave positive orders to Briggs to work with lamps only. Briggs demurred, but Mr. Kelsall insisted, and told him he should not work there at all unless he used lamps, and he saw him again a few hours before the accident, and emphatically repeated the caution. On Tuesday night Briggs and two sinkers and a labourer went down the shaft, taking two lamps, but they worked with naked candles, and two of the men smoked their pipes. According to Briggs, they put out the candles twice, and removing the scaffold tried if there was any gas, but a labourer who was down said the candles were never put out, and that he did not see the lamps lighted. Briggs went up to get a chain at a quarter to three, leaving word that as soon as they were ready for it they were to send the labourer for him, and they did so. Just as the two were about to descend a violent explosion occurred. The brakeman was knocked down the shaft, and he and two sinkers and a man in an air-way, who was blown to the other shaft, lost their lives. The jury returned a verdict of “Accidental Death,” but severely censured Briggs, as they could not avoid doing.

The Dudley and Midland Geological Society visited Hedgesford on Cannock Chase, on Tuesday week. Their attention was particularly attracted to the open works at the Hedgesford Colliery, at which is worked the Gubbin ironstone measures (embedded in oleaginous shale, which is said to contain 19 gallons to the ton), yielding 12 cwt. of capital ironstone to the square yard; and an exceedingly clear stratum of fire-clay of 8 ft., which is being made into white building bricks for the London market. The discovery of the extraction of oil from the coal shales of Staffordshire is of most remarkable import, not only as a valuable auxiliary to coal, but converting what had hitherto been looked upon as a worthless article into a valuable product. Various are the opinions as to the remote cause of oil in these shales—by some being placed to the account of the enormous quantities of the “mussel” tribe of shells existing in the then seas which covered the district; and by others to the richness of the carboniferous vegetation, or to the chemical process still going on in the bowels of the earth. From the Hedgesford Colliery open workings, the party next proceeded to the new trial sinking hole of Mr. McClean. Here it was found that the sinkers had just discovered, at a depth of 20 yards, Cannel coal of a highly

oleaginous nature, 14 inches thick, and said to be equal to the celebrated Scotch Torbane Hill Cannel, with a yard of coal underneath, which will enable it to be worked with great facility and economy. It is intended to use the coal for the distillation of mineral oil or petroleum, in which it is rich. In colour, lightness, and close texture it approaches nearly to jet, of which it probably is an impure variety. The party also visited the “new workings” of the Cannock and Rugeley Colliery Company, who have sunk two shafts 12 feet in diameter, for 200 yards in depth, and have discovered the celebrated Cannock Chase shale, low and deep coal, together with several other good workable seams. The shallow coal measure is full 9 ft. 6 in. thick, and the deep coal 7 ft. thick, both being of excellent quality.

#### REPORT FROM DERBYSHIRE AND YORKSHIRE.

AUG. 2.—There is no alteration to report in the state of trade in Derbyshire, and as regards both iron and coal business is much brisker than in almost any other part of the country. There being good understanding between employers and employed, the result has been that whilst in most localities the men have had notice of a considerable reduction in their wages, in the large works in South Derbyshire no alteration has been made, or even offered. At Clay Cross and Staveley the men are for the most part fully employed, and as many new works are all but completed, the demand for labour is likely to increase in a larger ratio than the supply, more especially as house accommodation is by no means equal to the demand. Several of the new collieries, like the Devonshire Silkstone, are making provision for the employment of a considerable number of workmen, so that a large number of houses are being put up close to all the pits in the course of being opened out. In the neighbourhood of Sheffield matters remain in about the same state as previously noticed, and although trade is anything but good, yet the prospects are more encouraging than they have been. In view of the termination of the war on the Continent, and the complete deposition of the American Tariff Bill, the present state of anxiety will shortly be relieved, and there is no doubt that orders to a considerable extent will soon be put in hand. As it is, there is every appearance that the well-known makers of heavy iron-plates, not only from the home Government but for the Continent, will have a large influx of orders.

In South Yorkshire the business doing is comparatively small, considering the ability of makers to supply; still, as the large number of furnaces damped out in the Cleveland district must send some little trade to other localities, the probability is that the business will increase in those places where the men have not appeared in a hostile attitude towards their employers. The demand for both hard and soft coal in Yorkshire continues good, but by no means equal to what could be supplied, so that several of our largest collieries have been obliged to stack. This the men are opposed to, and have preferred playing a day or two in preference to seeing a few thousand tons of coal put on the pit hill. The reason, no doubt, is that with a large stock on hand the masters for a short time are independent of the men, which the latter are quite aware of, and know that with some 20,000 or 30,000 tons stacked, and a bad trade, any of their demands would meet with a prompt refusal. In South Yorkshire, more than in any other part of the Kingdom, the men are aware of their power, so far as it goes, and consequently demand concessions which no other body of men in the trade would think of. At present they are the best paid colliers in England, and have advantages superior to most, seeing that their working time is limited to eight hours. The growing demand for machinery to supersede other power—either man or animal—seems likely to meet the requirements of colliery proprietors ere long.

In addition to several COAL-CUTTING MACHINES now in course of construction, Mr. Farrar, of Barnsley, has just patented a machine for underground work in drawing coals in lieu of horses. The first one made was put down a few days ago at the Willow Hall Colliery, and so far has given the greatest satisfaction. Still, as Mr. Farrar has invited me to see its working, I shall reserve a full description of it to a future letter in the *Mining Journal*.

In the Cleveland district the men continue out, the furnaces having been damped out on Saturday last; but as there is a large stock of iron in hand, and the trade very bad, the men will be the sufferers. From Hartlepool and Middlesbrough the export trade has fallen off, and a still further decrease of the business may be looked for unless the men submit to a reduction, which in the present state of the trade, and the inability of makers at home to compete with Belgian makers, is inevitable.

The Mechanical Engineers' annual meeting has been held in the Mechanics' Institute, Manchester—Mr. Joseph Whitworth, the well-known gun manufacturer, and President of the society, occupying the chair. The gathering has been a most interesting one, and several very valuable papers were read—the particulars of which are given in another column of this day's journal.

The engines and machinery in the extensive new works of the Dartington Iron Company, at Albert Hill, were set in motion in the presence of Mr. W. Birmingham, the head of the firm, and other gentlemen. The machinery is of the most approved kind, and has been manufactured under the care of Mr. Birmingham, at his works, Pendleton, Manchester, and on this occasion gave every satisfaction.

William Fitton, John Hudson, and Allen Boothroyd, employed by Mr. E. Brook, of Fieldhouse, were each fined 20s. and costs for unscrewing the tops of their safety-lamps, and working with naked lights.

The first sod of the Lancashire Union Railways—a scheme intended to open up more fully the mineral districts of South Lancashire—was cut yesterday in the township of Haigh, near Wigan, by Mr. Richard Moon, the Chairman of the directors of the London and North-Western Railway Company.

#### REPORT FROM MONMOUTH AND SOUTH WALES.

AUG. 2.—The principal feature to notice in the staple trades of the district is the withdrawal by the ironmasters of the notice of a reduction of wages, which was to have come into effect yesterday. The chief cause which actuated the masters in arriving at this decision was undoubtedly the almost certainty which exists in the minds of most people that a permanent peace will be established on the Continent; but it is well known, however, that this decision on the part of the employers was by no means unanimous. It was the opinion of several that a reduction of at least 10 per cent. was perfectly just under present circumstances, and a better opportunity for carrying it out could never have presented itself. On the other hand, several expressed a determination not to carry out the proposition, and hence there was no alternative left but for all to adopt the same course, because it would have been quite impossible for a few of the works to reduce the wages of the men, and the others to keep on at the old scale. Trade generally continues in a lethargic state, and the orders which have come in are few in number. These are principally on home and Eastern account, and amount in the aggregate to about 16,000 tons. Although the late panic has been a severe trial to makers, it has had the effect of destroying speculation, and, in the long run, those who conduct their business on sound *bona fide* principles will reap the greatest benefit. The rescinding of the resolution in the new American Tariff Bill, which increased the import duty on railway iron, and the postponement of the bill itself till December, has afforded much satisfaction, and several good contracts may now be expected to come in from the States. Besides these indications for a more hopeful feeling, it is reasonable to presume that the money market will shortly become easier, which will have the effect of bringing out those contracts on home account that have been so long kept back. Taking everything into consideration, although the present aspect of affairs is gloomy, there are fair grounds to believe that a change for the better will be inaugurated in a short time. It may here be stated that the intelligence announcing the successful laying down of the Atlantic cable was received in this district with great satisfaction, and as a large proportion of the Welsh manufactured iron finds its way into the markets of the United States, this expeditious mode of communication will prove a great boon to the ironmasters of the district. The pig-iron market is quiet, and neither makers or buyers evince any disposition to enter into transactions. The demand for tin-plates remains about the same, and quotations are moderately well maintained. There is no diminution in the demand for steam coal, and the various collieries are in active operation. The shipment of coal at the local ports for the foreign markets is carried on with much spirit, and there no longer exists any complaints of the detention of vessels in loading. Increased quantities are also sent by rail to the inland markets. The local consumption of house coal has lessened, but the demand coastwise has improved, in consequence of merchants having commenced stocking for the autumn and winter.

Four puddlers have been brought up before the magistrates at Penderrin, on a charge of stealing pig at the Hirwain Ironworks, and moulding it up in the middle of their heats, for the purpose of damaging the rolls. Mr. Simons appeared for the prosecution, and Mr. Bishop defended the prisoners. After going into the case at great length, which appeared to be assuming a very serious aspect, the prisoners were remanded for a month.

Messrs. Levick and Simpson, of the Blaenna and Coalbrookdale Iron-works, who were necessitated to suspend payment last year, have proposed, for the consideration of their creditors, a first dividend of 2s. in 1s. The London Gazette of last Friday announces the dissolution of partnership between Mr. J. Lilley and Mr. D. Howell, of the Pentre Gethling Colliery, Swansea.

At the Bristol and South Wales Railway Wagon Company meeting, the directors will state that the results of the past half-year have been most satisfactory. The revenue account now shows a disposable balance of

80217. 10s. 8d., after carrying 2115. 3s. 2d., being 5 per cent. per annum on the cost of wagons on hire, to the depreciation fund. The directors recommend a dividend at the rate of 10 per cent. per annum, and a bonus of 1s. per share; that the depreciation fund be in future named depreciation and reserve fund; and that 1000/- be carried thereto. There will then remain 597. 6s. to carry to the current half-year's accounts. Debenture bonds for 1400/- due on June 30, were renewed at the request of holders. The company's rolling-stock consists of 373 wagons. Mr. Handel Cosham has retired from the board, and Messrs. Ford and Gould retire by rotation, but are eligible for re-election.

The Cyfarthfa, Dowlais, and Plymouth Works, on Saturday last, were scenes of great rejoicing, not only among the workmen and their families, but also the general public, who testified in various joyous ways their delight that the proposed reduction in wages would not take place. The publicans dispensed most liberally large supplies of *corn da* in the fullness of their joy, and shopkeepers distributed ribbons of almost every colour, which were eagerly accepted and worn by the people. In fact, it was quite a gala day. Flags were suspended from windows, and the engines at the works were decorated with ribbons, flags, and evergreens. A large number got up an excursion to Swansea in celebration of the event, where they thoroughly enjoyed themselves.

It is stated that Mr. Thomas Powell has purchased a large extent of land in the neighbourhood of Caerphilly to sink one or two pits.

The Aber Coal Company shipped their first cargo of coal, of 100 tons, from Porthcawl, on July 18, in the *Neptune*, of Swansea, for Ireland. Our readers (says the *Swansea Herald*) are no doubt aware that the owners of this colliery, Messrs. Nicholson and Taylor, of Sunderland, hold the lease from the feoffees of the Swansea Grammar School; and to the enterprise of these gentlemen the well-wishers of the school are indebted for the opening out of this property. It is fortunate that the feoffees have in the Rev. C. T. Hartiey a headmaster with whom they can cordially co-operate; and we doubt not but that the efforts of all parties concerned will, ere long, make a school, which has such a valuable property attached to it, a great benefit to the town and neighbourhood.

#### THE INSTITUTION OF MECHANICAL ENGINEERS.

The proceedings connected with the moveable annual meeting of this institution, commenced in Manchester, on Tuesday. There was a large gathering of the members from various parts of the country, the assembly taking place in the lecture theatre of the Mechanics' Institution. Mr. Jos. Whitworth, President, occupied the chair, and he opened the meeting by thanking the members for having again elected him President, it being now the third time they had conferred upon him that honour.

Mr. W. P. MARSHALL, the secretary, after some preliminary business, read a paper by the President, “On the Proof of Guns by Measurement, with Description of the Instrument employed.” The best length for a solid projectile is three diameters, and the total weight of powder the gun can wholly consume is one-seventh of the weight of this projectile. Applying this rule to the 600-pounder gun now in our service, which has a bore of 13 in., it ought to fire a 900-lb. shot, and consume 141 lbs. of powder, while the American 15-in. bore gun should fire a 1522-lb. shot, with 217 lbs. of powder. These data showed that in these cases the bores were too large, and that the guns themselves were inefficient. The instrument designed by the writer for the proof of guns by measurement was illustrated by diagrams, and the writer stated that with care a skilful manipulation might always detect a difference of only one ten-thousandth part of an inch. During the competitive trials of the special committee, at Shoeburyness, in 1864, the writer designed this instrument for ascertaining the alteration which took place in the bore of the 70-pounder gun under trial. The measurements, which were carefully taken during the firing of nearly 3000 rounds, showed that the enlargements of the bore with successive charges of 10 lbs. of powder and 70-lb. shot were regular, and were due entirely to wear of the gun in the powder chamber; but when the powder charge was increased, and a large air space left, the gun being loaded each time with a number of shot, the enlargement of the bore was so rapid that a continuance of these charges must have led to the destruction of the gun. The instrument invented by the writer afforded the means of carrying out in the testing of guns the principle adopted in testing girder, by which any risk from undue strain was avoided.

Mr. J. RAMSBOTTOM, Crewe, read a paper describing an improved Reversing Rolling Mill, which has been in operation for seven months at the steel works of the London and North-Western Railway Company, at Crewe. The special point in the arrangement is that the rolls are driven direct by the engine without the intervention of a fly-wheel, and the engine and rolls together are reversed each time that a heat is passed through, the rolling being alternately in opposite directions. The idea of reversing a train of rolls by reversing the engine at each passage of the heat through the rolls was first suggested by Mr. Nasmyth, but has never yet been carried out.

On Wednesday, the first paper read was “On Boiler Explosions and their Records, and on Inspection as a means of Prevention,” by Mr. EDWARD B. MARSHALL, of Stourbridge. The paper was most elaborate, and, with the aid of diagrams, a description was given of all the known forms of boilers, with representations of the kinds of rupture they had undergone. The records of boiler explosions, as gathered from each year of the present century, showed that no fewer than 1046 had occurred, causing the deaths of 4076 persons, and injury to 2903. Of the 1046 explosions, 397 were uncertain as to their cause; 137 were from over-pressure, from safety-valves being wedged or over-weighted, or from other acts of carelessness; 113 from collapse of internal flues; 114 from shortness of water or from incrustation; and 9 from extraneous causes, as lightning, fire, and explosion of gas. The writer was opposed to all idea of internal detonation, or other mysterious causes of explosion. The first real cause he held to be fault in the boiler, arising from bad shape, bad stays, bad material, or bad workmanship; the second, mischief arising during working, either from wear and tear, over-heating, shortness of water, accumulation of scurf, corrosion, flaws or fractures in the material, or undue pressure through want of sufficient escape arrangements. He recommended that boilers should not be covered by brickwork, &c., which often concealed the corrosion going forward, but that they should simply have a light roof. He had known five boilers which had been so much injured by having sand put upon them, that they had to be re-plated on their upper sides. Many portions of ruptured plates of various forms were exhibited, some being attributed to corrosion, others to unequal expansion, or to constant vibration

hydraulic pressure. Of the boiler examinations, 201 have been external, 10 internal, 129 entire. In the boilers examined, 87 defects have been discovered, seven of those being dangerous. An explosion occurred at a colliery at half-past three o'clock on the morning of Monday, July 2, and resulted in the loss of four lives. The boiler, which was not under the inspection of the association, was of the plain cylindrical externally-fired class. There is nothing either unaccountable or unavoidable in these explosions. The majority of those at collieries arise simply from the use of plain cylindrical externally-fired boilers, which are so dangerous and treacherous as to be entirely untrustworthy. Several explosions, the particulars of which have not yet been reported, have occurred during the last few months to internally-fired single-flued or Cornish boilers, all of which might have been prevented by strengthening the furnace tubes with encircling hoops or flanged seams.

**THE TIN TRADE.**—Mr. L. Th. van Houten (Rotterdam, July 31) writes—The demand for tin has been good throughout this month, and the more favourable aspect of continental politics caused a steady advance. For Banca the market improved to 47½ fl. in the early part of the month, but subsequently declined to 46 fl. Upon the declaration of the suspension of hostilities the demand became more active, accompanied by an advance to 47½ fl. In Billiton no business has been effected. Several fresh arrivals are reported to-day. The position of Banca tin in Holland on July 31, as shown by the official returns of the Dutch Trading Company, was—

	1865.	1864.	1865.	1864.
Import in July.	Slabs 9,739	10,741	2,616	
Total seven months.	135,425	115,760	102,288	
Deliveries in July.	4,575	27,297	25,851	
Total seven months.	99,230	61,604	68,039	
Total stock.	226,824	200,467	162,753	
Quotation, July 31, new terms 47½ fl. 54½ fl. 60½ fl.				

These returns, compared with those of 1865, show a decrease of the import for July of 297 tons; an increase of the import for the seven months of 19 tons; a decrease of the deliveries for July of 716 tons; an increase of the deliveries for the seven months of 1185 tons; a decrease of the stock second-hand of 2036 tons; an increase of the unsold stock of 2867 tons; an increase of the total stock 831 tons; and a decline of the quotation of 11½ ss. per ton. The Government returns for the month of May are as follows:—

EXPORT OF TIN.		May.				Five months.			
	1865.	1864.	1865.	1864.	1865.	1864.	1865.	1864.	
Germany.	Tons 288	67	123	1096	535	528			
Belgium	35	29	27	229	132	143			
England	224	18	16	394	77	153			
France	172	41	124	616	227	216			
Hamburg	56	15	6	164	43	28			
United States	10	—	—	149	26	18			
Other countries	75	35	9	263	63	35			
Total	860	196	305	2851	1103	1116			
According to the official returns, the import of the tin for consumption in France has been—									
May.									
England	Tons 184	1865.	1864.	1866.	1865.	1864.			
Belgium	4	175	137	821	1172	842			
Holland	285	32	49	763	254	280			
Other countries	22	59	42	89	347	238			
Total	499	266	249	1694	1773	1451			

Messrs. Von Dadelzen and North (Aug. 2) write:—The arrivals towards the next Dutch sale of Banca continue large, and the old and new stock there now amounts to 226,824 slabs, independently of a supply of about 16,000 slabs Billiton, or considerably over twelve months' consumption. A movement is being made in Cornwall to decrease production, the losses incurred by the miners being so heavy; and there is some talk of sending out an experienced captain to the East, to obtain information as to the cost of producing tin in the Dutch settlements, as well as in the Straits of Malacca, and Junk Ceylon; but of this we may rest assured, that at a low price for the metal, the mines of Cornwall cannot successfully compete with the East, where labour is so much cheaper, and where the tin itself is so much nearer the surface.

**COAL MARKET.**—The arrivals this week amounted to 94 ships. For household coal the demand has been less active, but nearly the whole quantity is cleared off at a reduction of from 6d. to 9d. per ton on last week's quotations. Hartley's steady, and without alteration in prices. Hetton Wallsend, 20s. 3d. per ton; South Hetton Wallsend, 20s.; East Hartlepool Wallsend, 19s. 6d.; Braddyl's Hetton Wallsend, 19s.; Tees Wallsend, 19s. 6d.; Eden Main, 18s. 6d.; Kelloe Wallsend, 18s. 3d.; Tunstall Wallsend, 17s. 9d.; Hetton Lyons Wallsend, 17s. 9d. per ton: 3 cargoes unsold; at sea, 20 ships.

#### MINING NOTABILIA.

[EXTRACTS FROM OUR CORRESPONDENCE.]

**THE COPPER TRADE** at last shows some signs of improvement—the exports for the last month, as stated in the Board of Trade returns, show an increase of nearly 25 per cent. as compared with the preceding. Such an increase should certainly have a material effect in reducing the present stocks, and should send up prices.

Some splendid gold is reported to have been broken at CLOGAU on Tuesday last.

**NEW CLIFFORD.**—Notwithstanding the depressed state of mining in the Gwennap district, the works at this promising mine are being pushed on with vigour. The engine-shaft is down 36 fms., the flat-roof shaft 20 fms., and the agent is of opinion that a course of copper ore is near at hand. There is little doubt but the shareholders will soon be well rewarded for their outlay.

**PRINCE OF WALES.**—This mine has attracted a great amount of attention from the success of the operations, the discovery of a rich course of copper ore, and the raising and sale of about 5000 tons worth from 9 fms. driving and 3 fms. stope, and is now considered to be second only to the first discovery at Devon Great Consols and East Caradon. Water-power enabled the company to make this discovery, but for the further working it was decided to erect a steam-engine.

To show the energy of those engaged in this work, it will be enough to say that in two days short of seven weeks the quarry was opened, the engine-house, stack, &c., built, and the engine erected and set to work. Such an event at the present time is of great importance, and it is hoped it may prove a turning point, the recent great depression in the metal market having caused the stoppage of very many mine engines, so that the erection of one is quite an exception. Coupling this with the fine discovery, in a first-class position on the junction of the Killas and granite, on Hinstone Down, it need not create surprise that the celebration of setting the engine to work caused great satisfaction. About 1 o'clock on Saturday last Mr. Wm. Matthews, the engineer, started the engine in the presence of a large number of shareholders, mine agents, and all employed on the mine, who, on the first stroke of the engine, gave three hearty cheers for the success of the undertaking, and christened the shaft "Watson's shaft." The men were then regaled with beer, and each presented with 2s. 6d. in celebration of the event, while the shareholders and friends adjourned to the account-house, where an excellent dinner was served up, the chair being taken by the London secretary, Mr. John Hitchins, and the vice-chair by the purser, Mr. H. E. Croker, of Plymouth. Amongst those present were—Messrs. W. Matthews, W. Matthews, jun., Jos. Matthews, W. Kendall (Redruth), A. Prout, H. Pearce, J. Pearce, J. Vosper, and Capt. H. James (Redruth), T. Taylor, G. Rowe, W. C. Cock, J. Key, John Gifford, W. Collom, W. Gifford, H. Rickard, G. Rowe, P. W. Mitchell, &c. The usual loyal toasts were given and responded to, as well as "Success to the Mine," &c., and a very successful meeting terminated, with a hope that the day may not be far distant when they should meet again to start "Engine Number Two," and that success might attend many of their neighbours, and be shared in by the county generally.

**EXTRAORDINARY SALE OF MINE MACHINERY.**—At Redruth last week the whole of the plant of South Carn Brea Mine was sold. In the present time of great mining depression, when so much machinery and mine materials are offered for sale, it could not be expected that such property would realise anything like its average value; but prices realised last week were far less than before known as prices for expensive machinery, &c. There were three draught engines, pitwork, tin leavings, copper ore, &c., and the whole, although the machinery, &c., cost over 10,000*£*, was sold for about 900*£*. Mr. W. H. Tregoning, a large shareholder in Wheal Seton, and Mr. Edward King, of Ainstyfriars, proprietor of Great Bury and other mines, are stated to have been the purchasers.

At Mr. Marsh's periodical sale, at Guildhall Coffee-house, on Thursday, 110 shares in the Val Sassan Mining Company were submitted for sale. The auctioneer called attention to the fact of the mines being under the management of Messrs. J. Taylor and Son, and that it was expected in a short time some very important discoveries would be made. The shares were limited to 10*£* each, of which amount 5*£*. 10*s*. per share had been paid, and the purchaser would have to pay another call of 10*s*. per share on the 4th inst. The reserve price being in excess of the highest bid made, the shares were not sold.

The Master of the Rolls has appointed Mr. S. Lovelock, of Coleman-street, official liquidator of the Ramsgate Victoria Hotel Company (Limited).

**M**R. E. HARVEY WADGE, F.G.S., Editor of the "IRISH INDUSTRIAL MAGAZINE," begs to announce to the subscribers and to the public that the PUBLICATION of that periodical HAS CEASED. In making this announcement Mr. WADGE desires to return his grateful thanks to the numerous subscribers and contributors who have so heartily supported his enterprise. The amount of support received has been far greater than could have been anticipated, and would have undoubtedly resulted in making the "Irish Industrial Magazine" an ultimate success in every respect, if Mr. WADGE's other engagements had permitted his devoting to it an adequate proportion of his time.

As it is, however, Mr. WADGE finds this to be impossible. His object throughout has been the promotion of Irish industry, and it was his opinion that, in the first instance, this would be best attained by the establishment of a periodical devoted exclusively to the discussion of its conditions. The result has not disappointed his expectations, for the amount of public attention the Magazine has drawn to the industrial resources of Ireland has been the means of attracting a large amount of British capital to their development. In the direction of some of these investments Mr. WADGE now finds that such a large proportion of his time will be absorbed as to render an adequate supervision of the "Irish Industrial Magazine" on his part impossible; and as there can be no question that he will best serve the cause of Irish industry by bringing about an active expenditure of capital in developing its various and magnificent resources, he has not hesitated in abandoning whatever could interfere, in however small a degree, with his exclusive devotion to this object.

#### THE UNITED KINGDOM PATENT FUEL COMPANY (LIMITED).

Incorporated under the Companies Act, 1862 (25 and 26 Vic., c. 89).

Capital £100,000, in 10,000 shares of £10 each.

(With power to increase the amount.)

£1 per share payable on application, £2 on allotment, and £2 on January 1, 1867,

beyond which it is not anticipated any call will be made.

Two thousand shares have already been taken by shareholders of the London Patent Coal Company (Limited).

DIRECTORS.

DANIEL CLARKE, Esq., 22, Milner-square, N.

T. R. DENNY, Esq., Corn Exchange Chambers, Mark-lane (Chairman of the London Patent Coal Company).

WILLIAM FOOKES, Esq., Pewsey Wharf, Marlborough, Wilts.

GEORGE HAMMOND, Esq., Horsmonden, Kent.

B. J. HUDSON, Esq., Great Peter-street, Westminster (Director of the London Patent Coal Company).

(With power to add five to their number.)

CONSULTING ENGINEERS.

Messrs. Davison and Scamell, 1, London-street, E.C.

BANKERS.

The London and County Bank, Lombard-street, and its branches.

SOLICITORS.

Messrs. Digby and Son, 35, Lincoln's Inn-fields, W.C.

SECRETARY (pro tem.)—E. L. Cockerell, Esq.

BROKER.

John Inman, Esq., 15, Throgmorton-street and Stock Exchange.

OFFICES,—26, MARTIN'S LANE, CANNON STREET, E.C.

WORKS,—NORTHFLEET, KENT.

#### PROSPECTUS.

This company is formed for the purpose of purchasing and extending the operations of the London Patent Coal Company (Limited), a company formed in the latter part of the year 1864, having for its immediate object the utilisation of small coal or coal dust. The entire success of this latter company as an experiment has rendered the establishment of the present company a matter of absolute necessity.

No one unacquainted with the working of coal mines can have any conception of the enormous waste at the pit's mouth. The dust, which in many cases contains the most valuable properties of the coal, has been considered as worse than useless, whereas its conversion into blocks under the process of this company's patent renders it at least as valuable as large coal for manufacturing and locomotive purposes.

The recent discussions in Parliament and the public press, which the limits of a prospectus render it impossible to extract, make the present a most favourable and advantageous moment for extended operations. While it is believed there is little cause for alarm in anticipation of a stoppage in the supply of coal, it is, nevertheless, open to grave apprehension whether the extraordinary waste now going on will not eventually cause such an advance in its price as materially to cripple the industry and manufactures of the country.

From amongst the numerous communications which have recently appeared in the daily papers on the "Coal Question," the following letter, extracted from the Times of May 9, 1866, has been selected, as it bears upon the very points which this company is prepared to carry out, and emanates from a gentleman thoroughly conversant with the subject on which he writes:—

THE EXHAUSTION OF OUR COAL BEDS.

(To the Editor of the Times.)

SIR.—The question of the duration of our coal fields is now attracting so much attention that I am induced to address this letter to you.

In February, 1861, I read a paper "On the large proportion of Coal lost in working," before the members of the South Wales Institution of Engineers, in which I gave the results of several investigations I had made over extensive areas of exhausted coal fields, and proved that the loss of coal in working had in three instances exceeded 30 per cent. of the actual contents of the seam or vein of coal, and that even a higher percentage was lost in some of the steam coal collieries.

It may be that the improved system of working coal has in many instances diminished this proportion of loss, but, under the most favourable circumstances, a very large quantity of small coal is left behind in the mine, which will not repay the owner the cost of raising it to the surface, as no market can be obtained for it. As representing very extensive mining interests, I feel it would be impossible to overrate the great gain which would result if some practical and economical means could be discovered for the conversion of small non-bituminous coal into blocks, without the use of the expensive ingredients now employed in manufacturing "compressed coal" or "patent fuel."

The price now paid for "patent fuel" is rather higher than the price obtained for large steam coal.

The importance of this subject is of such magnitude that I respectfully suggest the necessity of a Government Commission of Inquiry to lay the facts before the public, and ascertain if by the combined aid of science and chemistry some means can be discovered to arrest this enormous loss in our coal fields.

A premium might be offered for the best method of converting the small coal at the pit's mouth into a marketable commodity, which would insure a practical investigation of the subject by chemists and scientific men.

Cardiff, May 5. ALEXANDER BASSETT, M.I.C.E., Past President of the South Wales Institution of Engineers.

The purchase will include Mr. David Barker's patent, for the purpose of working which the London Patent Coal Company (Limited) was formed. It will also include the lease of most valuable premises on the banks of the Thames at Northfleet. These are admirably adapted for the purpose, in good repair,

**CONSOLIDATED COPPER MINES OF COBRE.**—Notice is hereby given, that a SPECIAL GENERAL MEETING of the proprietors of this association will be HELD at the offices of the company, Gresham House, Old Broad-street, in the City of London, on TUESDAY, the 21st day of August inst., at One o'clock in the afternoon precisely, for the purpose of confirming certain resolutions passed at a special general meeting of the proprietors of the association, held on the 31st day of July, 1866.

Dated August 2, 1866.

H. R. GRENFELL, *Esq.*, Directors of the  
WALTER SHARP, *Esq.*, Company.

**CONSOLIDATED COPPER MINES OF COBRE.**—At a HALF-YEARLY GENERAL MEETING of the proprietors of the association, held at the offices of the company, Gresham House, Old Broad-street, this 31st day of July, 1866.

HENRY R. GRENFELL, *Esq.*, M.P. (Chairman), in the chair.

The advertisement convening the meeting having been read, the following reports were read:—

The audited account for the year 1865 is now submitted to the shareholders. In consequence of the indisposition of Mr. Thomas Curtis, one of the auditors, the directors have availed themselves of the services of Messrs. Cooper Brothers and Co., public accountants, to assist in the audit.

With reference to the operations of the past year, two causes combined will fully account for their being so unsatisfactory—the first, the continued accidents that have occurred to the machinery, and consequent inability to work the most profitable parts of the mines, which were solely reported upon by Mr. Petherick in his report dated June 8, 1863, and from which, since July, 1864, to the end of May of the present year, scarcely any ores have been raised, thereby entailing a great falling off in the produce, without a corresponding diminution of expenses; and, secondly, the continued prostration of the copper market, the fact being that, taking the price of the ores fetched in January last as compared with the present price, a difference exists in the value of each cargo of about £2000. This, upon 10 cargoes, some of which have been lately sold, and others at sea, and expected to arrive in the next two or three months, alone amounts to the sum of £20,000.

The ores raised during the first five months of this year amount to 5344 tons, being 11 tons less than those of the same period in the preceding year; of these, 3302 tons were dust ores for shipment, 1233 tons poor ores for smelting, 696 tons stone, and 43 tons precipitate, of an average, exclusive of the poor ores, as nearly as can be ascertained, of 13 1/4 percent. Those already sold have realised 13s. 1d. per unit, whereas those sold in 1865 averaged 15s. 6d. The poorer ores average about 8 per cent.

The make of regulus to the end of May has been 290 tons, being 34 tons less than that of last year. The regulus sold up to the present time has averaged 30 per cent.

The smelting works now consist of five calciners and four furnaces; and materials have been sent from this country for the erection of six additional calcining furnaces, on an improved principle. When these are all in operation better results are anticipated.

With reference to the future prospects and capabilities of the mines, and the state and power of the machinery at the mines, the directors have requested Mr. Petherick to consider the subject, and report specially thereon, which he has done, and they have now the pleasure of submitting his report for the consideration of the shareholders, which it will be seen that the capabilities of the works for producing ores are as good as at the time of his visit to them, in the year 1863, the great drawback being the very depressed price of the ores now fetched.

A vacancy having occurred in the direction, by the resignation of Henry Bruce, Esq., the directors do now, on the present occasion, propose to fill it up.

The shareholders will observe that at the conclusion of the present meeting it is proposed to hold a special general meeting for the purpose of accomplishing the objects stated in the advertisement calling such meeting, in reference to which the capital account and balance-sheet of the company, up to Dec. 31, 1865, are now laid before the shareholders; also an estimated account of the probable out-turn of the operations for the first five months of the present year.

It was then moved, seconded, and carried unanimously:—

That the report of the directors and the accounts now read be received and adopted.

At the conclusion of the half-yearly general meeting a SPECIAL GENERAL MEETING was immediately held, at which resolutions were passed:—

1.—For increasing the company's capital.

2.—For registering of the shares of the company's capital, and of transfers of the shares.

3.—The cancelling of the now existing certificates of shares, and the issuing of new certificates in exchange.

4.—For repealing certain of the company's regulations established by their supplementary Deed of Settlement of Nov. 24, 1838.

5.—For reviving certain of the company's regulations established by their Deed of Settlement of 13th July, 1835, and repealed in whole or in part by that supplementary Deed.

6.—And for registering of the company under the Companies Act, 1862, as a limited company.

It was then moved, seconded, and carried unanimously:—

That the best thanks of the proprietors be given to the Chairman and Directors, for their services in conducting the affairs of the company.

To the Chairman and the Board of Directors of the Consolidated Cobre Copper Mining Company.

*Surbition, July 20, 1866.*—In compliance with the request contained in your communication to me on the 2d inst., I now beg to submit for your consideration the following observations on the several points to which my attention has been specially directed, founded on a careful consideration of the contents of the several reports and estimates of the chief mining agent of the Cobre Mines, and other documents relating to those concerns of comparatively recent date, placed in my hands for that purpose:—

From the mine agent's monthly reports and statements, it is quite evident that the falling off of the returns during the last year is due to the neglected state of the old mine, "Ysabelita," and to the partial suspension of the underground operations there, in consequence of the defective state of Ellies' pumping-engine, and other causes to which, on this occasion, I need not more particularly refer. A very considerable extent, therefore, of productive ground, discovered and partially laid open previous to my visit of inspection in 1862, still remains unexplored and available for future returns in the bottom levels of this mine; and taking into account the subsequent discovery of the north lode in the Great Mine, which has yielded considerable returns, and still continues very productive, it appears to me that the mines, on the whole, are at present in a more productive state than they were three years since, when the returns from the Old Mine exclusively were estimated at 1130 tons of dressed ores per month. Under such circumstances, therefore, I have no hesitation in expressing my conviction that by proper attention be paid to the keeping of the machinery in efficient working order, so as to drain the Old Mine effectually, and avoid the frequent interruptions of the underground operations, hitherto so detrimental to the company's interests, there is every probability that the future monthly returns will amount to at least 1400 tons of ores of a probable average percentage of 13 1/4%. The present smelting works erected on the mines consist of four smelting-furnaces, with the necessary calciners; and, assuming that three smelting-furnaces are kept in full operation at all times, they are sufficient for the treatment of from 450 to 500 tons of ores per month. On referring to the accounts, however, for the four months ending May last, I find that the quantity of ores treated at the works did not exceed 370 tons, or an average of 342 tons per month. The quantity of regulus to be produced within any given period will, of course, depend upon the percentage of the ores to be treated, as well as the degree of concentration to which they are to be reduced; but, assuming that the quantity of ores to be operated on at the Cobre Smelting Works amounts to the minimum of 450 tons per month of an average percentage of 8 percent, the quantity of regulus produced should be about 106 tons of 34 per cent. I am, however, of opinion that in order that the maximum amount of advantage should be derived from the smelting works, the ores should be concentrated to at least a regular 40 per cent., which would reduce the monthly quantity obtainable from 450 tons of ores to 90 tons per month, thus effecting an additional saving of the export charges on 16 tons of regulus, amounting to £76 per month, or say £960 per annum. With the whole of the productive portions of the mines in regular and continuous operation, the future monthly produce, as already stated, may be estimated at 1400 tons of an average percentage of 13 1/4%; and of that quantity I assume that from 450 to 500 tons of 8 percent, can be treated at the smelting-works, leaving for exportation in the raw state from 900 to 950 tons of an average of 16 per cent. During the five months ending May last the monthly returns averaged 1073 tons of ores, whilst the working expenses, during the same period amounted, on an average, to £5383 3s. 6d. per month, and the average cost per ton to £5 1s. 4d., being considerably above the estimated amount. The result is, no doubt, attributable mainly to the falling off in the quantity of the ores raised, as compared with former returns; and as the establishment charges are fixed, in great measure, and will not vary materially in either case, it necessarily follows that with the estimated increase of returns, there would be a corresponding reduction of the cost per ton; and making every reasonable allowance for contingencies, I think that with a proper attention to economy they should not then exceed at the utmost £4 1s. per ton, and on these data I am of opinion that the mines can, even at the present low price of copper, be worked without loss to the shareholders, provided the expenditure in every department be reduced to the lowest amount compatible with efficiency. The pumping machinery now on the mines appears to me to be sufficient, if put into an efficient state of repair, and properly attended to afterwards, to keep the mines effectually drained; and, under existing circumstances, I do not think that any extraordinary outlay for new machinery will be required; it will, however, be necessary to incur the expense of replacing the remaining defective pumps and rods in Ellies' shaft in the first instance; and also of repairing Ellies' pumping-engine, so that it may, in case of accident, be made available as an auxiliary to Hardy's engine, and thus lessen the danger of an interruption of the underground operations. In conclusion, I would strongly advise that, until a satisfactory arrangement for a reduction of the present enormous railway charges on the transit of the ores, and of the materials required for the use of the mines, shall be come to, all expenditure on works of a purely speculative and unproductive character should be avoided; and that the working expenses should be confined, as far as practicable, to the further exploration of the productive portions of the lodes, and the extraction of the ores already discovered.

JOHN PETHERICK, F.G.S.

**M**R. CHARLES BAWDEN, INSPECTING MINE AGENT, ST. DAY CORNWALL, OFFERS HIS SERVICES TO CAPITALISTS SEEKING TO INVEST IN *bona fide* MINES.

**P**RINCE OF WALES.—Through an error in transcribing, we last week understated the distance between this mine and East Caradon. It should have been some 10 miles. Not that any comparison exists between them, as hitherto not a mine in the neighbourhood of the former has repaid its call expenditure. Bunches of ore have been met with, which have usually only afforded opportunities for running up shares, to the heavy loss of unfortunate purchasers. In our opinion, the large advance in Prince of Wales is unwarranted, not an ounce of ore having been discovered since the shares were at 6s. each. We advise our friends to sell, as, if the market turns, it will be next to impossible to get rid of them.

T. TREVOIR AND CO.

July 30, 1866.

Read Trevoir and Co.'s "Mines and Mining," forwarded for three stamps, by C. J. Chapman, 3, Upper John-street, Barnsbury-park, London, N.

In the Court of the Vice-Warden of the Stannaries.  
Stannaries of Cornwall.

**I**N the MATTER of the COMPANIES ACT, 1862, and of the WEST CRINNIS COPPER MINING COMPANY.—By the direction of his Honour the Vice-Warden, notice is hereby given that on Tuesday, the 14th day of August next, at the Registrar's Office, at Truro, in the county of Cornwall, at Eleven o'clock in the forenoon, this Court will PROCEED to MAKE a CALL OF ONE POUND SIX SHILLINGS AND EIGHT PENCE PER SHARE on all the contributors of the said company settled on the list of contributors under Class A.

All persons interested therein are entitled to attend at the time and place aforesaid to offer objections to such call.

Dated this 28th day of July, 1866.

In the Court of the Vice-Warden of the Stannaries.  
Stannaries of Cornwall.

**I**N the MATTER of the COMPANIES ACT, 1862, and of the ST. JUST UNITED TIN AND COPPER MINING COMPANY (LIMITED).—By an order made by his Honour the Vice-Warden of the Stannaries in the above matter, dated the 26th day of July last, on the petition of William John Rawlings, of Hayle, within the said Stannaries, a creditor of the said company, it was ordered that the ST. JUST UNITED TIN AND COPPER MINING COMPANY (LIMITED) should be wound-up by the Court, under the provisions of the Companies Act, 1862.

HODGE, HOCKIN, AND MARRACK, Solleitors, Truro.

Dated Truro, 28th July, 1866.

In the Court of the Vice-Warden of the Stannaries.  
Stannaries of Cornwall.

**I**N the MATTER of the COMPANIES ACT, 1862, and of the WEST PAR CONSOLS MINING COMPANY.—By the direction of his Honour the Vice-Warden, notice is hereby given, that on Monday, the 13th day of August last, at the Registrar's Office, at Truro, in the county of Cornwall, at Eleven o'clock in the forenoon, this Court will PROCEED to MAKE a CALL OF SEVEN SHILLINGS AND SIXPENCE PER SHARE on all the contributors of the said company settled on the list of contributors under Class A.

All persons interested therein are entitled to attend at the time and place aforesaid to offer objections to such call.

Dated the 1st day of August, 1866.

WILLIAM MICHELL, Registrar.

In the Court of the Vice-Warden of the Stannaries.  
Stannaries of Cornwall.

**I**N the MATTER of the COMPANIES ACT, 1862, and of the RETANNA HILL MINING COMPANY.—By the direction of his Honour the Vice-Warden, notice is hereby given, that on Monday, the 13th day of August last, at the Registrar's Office, at Truro, in the county of Cornwall, at Eleven o'clock in the forenoon, this Court will PROCEED to MAKE a CALL OF SEVEN SHILLINGS AND SIXPENCE PER SHARE on all the contributors of the said company settled on the list of contributors under Class A.

WILLIAM MICHELL, Esq., Registrar of the said Court at Truro.

In the Court of the Vice-Warden of the Stannaries.  
Stannaries of Cornwall.

**I**N the MATTER of the COMPANIES ACT, 1862, and of the DUKE MINING COMPANY.—By the direction of his Honour the Vice-Warden, notice is hereby given that on the 14th day of August next, at the Registrar's Office, at Truro, in the county of Cornwall, this Court will PROCEED to MAKE a CALL OF TEN SHILLINGS PER SHARE on all the contributors of the said company settled on the list of contributors under Class A.

All persons interested therein are entitled to attend at the time and place aforesaid to offer objections to such call.

WILLIAM MICHELL, Registrar of the said Court.

In the Court of the Vice-Warden of the Stannaries.  
Stannaries of Cornwall.

**I**N the MATTER of the COMPANIES ACT, 1862, and of the DUKE MINING COMPANY.—By the direction of his Honour the Vice-Warden, notice is hereby given that on the 14th day of August next, at the Registrar's Office, at Truro, in the county of Cornwall, this Court will PROCEED to MAKE a CALL OF TEN SHILLINGS PER SHARE on all the contributors of the said company settled on the list of contributors under Class A.

WILLIAM MICHELL, Registrar of the said Court.

VALUABLE FREEHOLD ESTATE, WITH COPPER MINE, MACHINERY, AND MATERIALS.

**M**ESSRS. SKARDON AND SONS WILL SELL, BY AUCTION, at the Bedford Hotel, Tavistock, on Tuesday, the 7th day of August, 1866, at Two o'clock P.M., subject to conditions to be then produced, all that VERY VALUABLE FREEHOLD ESTATE, known as the COLCHARTON ESTATE, situated near TAVISTOCK, in the county of DEVON, consisting of a capital FARM of about 67 acres of well-cultivated land, and excellent homestead and farming appointments, now in the occupation of Mr. GILL; also, that VERY PROMISING COPPER MINE thereon, partially developed by the Great Devon and Bedford (Colcharton) Copper Mining Company (Limited), now in course of voluntarily winding-up, with all its mineral rights, and the engine-house, offices, powder-house, carpenters' and smiths' workshops, tools, plant, machinery, and materials thereunto belonging, comprising ONE 30, in. diameter cylinder double-rotary STEAM-ENGINE, with fly-wheel 11 tons, 10 ton BOILER, sweep rods and cranks attached, complete. The whole will be offered in ONE Lot.

The mine is kept dry, and has been worked up to the present time. Possession will be given immediately after the sale. The entire property being freehold, and the surface and minerals sold, there will be no royalties payable.

The whole can be inspected by applying to the agent, Capt. WILLIAM SKEWES, Tavistock; or to Capt. JAMES RICHARDS, on the mine, who are instructed to afford every information respecting the state and prospects of the workings and lodes; and further particulars and handbills can be obtained of the auctioneers, Plymouth; J. H. SKYME, Esq., solicitor, Rose; or of the liquidator of the company, Mr. THOMAS BLAKE, public accountant, Bank Offices, Rose.

CARMARTHENSHIRE.

VALUABLE FREEHOLD ESTATES, in the parish of Llanon, about five miles from the flourishing town and seaport of Llanelli, comprising the FARMS called CURN HOWELL, CWMLETTYLEDREW, MUDDLEScombe, MORLAIS, PENDERY WELL, GELLYRHWWYDD, BANKMAUR, and DILDRA, containing together 522 acres, rich in MINERALS, and with suitable RESIDENCES and HOMESTEADS. Possession at Michaelmas.

**M**ESSRS. DRIVER AND CO. are instructed to SELL, BY AUCTION, on Thursday, the 9th August, in five lots, at the Ship and Castle Hotel, Llanelli, at Five for six o'clock precisely, the above VALUABLE PROPERTIES.

Full particulars and conditions of sale, with plans, are in preparation, and may shortly be had at the Ship and Castle, Llanelli; the Mackworth Arms, Swansea; the Estate Exchange, Change-alley, Cornhill; of Messrs. PARTRIDGE AND EDWARDS, solicitors, King's Lynn; of Mr. EDWARD BAGOT, C.E., Llanelli; and of Messrs. DRIVER and CO., surveyors, land agents, and auctioneers, No. 4, Whitehall.

AUGUST 21, 1866.

**M**R. T. T. WHEAR is instructed to OFFER FOR SALE, BY PUBLIC AUCTION, at Tyack's Hotel, in Camborne, on Tuesday, the 21st day of August, at Three o'clock in the afternoon, SHARES in the following (DIVIDEND and PROGRESSIVE) MINING and OTHER COMPANIES, viz.:—

EARL POOL  
SOUTH WHEAL FRANCES  
WEST WHEAL FRANCES  
WEST WHEAL SETON  
WHEAL GRENVILLE  
EAST WHEAL GRENVILLE  
GREAT WHEAL BUSY  
NORTH ROSKEAR  
SOUTH WHEAL CROFTY  
THE FALMOUTH DOCKS, and FALMOUTH HOTEL.

With a little advance in the price of tin and copper, several of the above mines not already leaving profits, will, doubtless, pay large dividends.

CARMARTHENSHIRE, SOUTH WALES.

**M**R. ROBERT HOW has been favoured with instructions to SELL, BY AUCTION, at the Railway Station, Carmarthen, on Friday, Aug. 24, 1866, TWO very powerful BROAD GAUGE LOCOMOTIVE ENGINES, of superior construction, and but recently built, by Messrs. Rothwell and Co., Bolton. Also, a small but very useful BROAD GAUGE ENGINE.

The engines, which will be sold singly, may be inspected at Carmarthen station, where all information respecting them may be obtained. Conditions will be produced at the sale. Sale to commence at Three P.M. Catalogues will be forwarded on application to the Auctioneer, Allihallows Chambers, No. 49, Lombard-street, London, E.C.

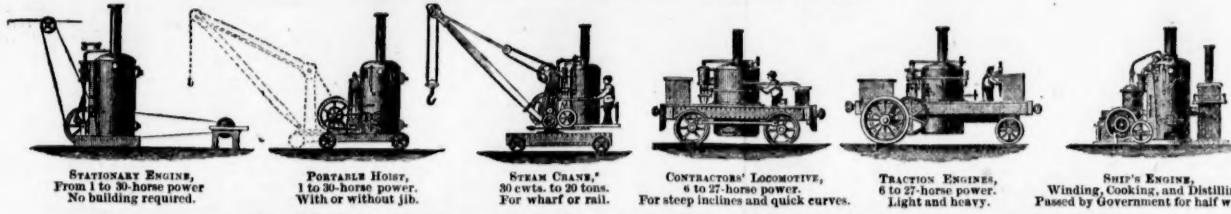
TO BE SOLD, BY AUCTION.

**J**OSEPH DUNSTAN'S MONTHLY SALE of MINE SHARES WILL TAKE PLACE at Karbeck's Seven Stars Hotel, Truro, on WEDNESDAY next, 1st of August, at Four o'clock in the afternoon, among which there are several dividend and progressive mines. Parties wishing to offer shares at this auction will please communicate with the auctioneer without delay.

## CHAPLIN'S PATENT

## PORTABLE STEAM ENGINES AND BOILERS.

PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862.



\* These cranes were selected by H.M. Commissioners to receive and send away the heavy machinery in the International Exhibition.

From the STRENGTH, SIMPLICITY, and COMPACTNESS of these ENGINES they are extensively USED for GENERAL PURPOSES, and also in situations where STEAM-ENGINES OF THE ORDINARY CONSTRUCTION CANNOT BE APPLIED.

## ALEXANDER CHAPLIN AND CO., PATENTEES AND SOLE MANUFACTURERS,

CRANSTONHILL ENGINE WORKS, GLASGOW. LONDON OFFICE,—11, ADAM STREET, ADELPHI, LONDON, W.C.

ENGINES OF EACH CLASS KEPT IN STOCK for SALE or HIRE, and ALL OUR MANUFACTURES GUARANTEED as to EFFICIENCY, MATERIAL, and WORKMANSHIP.

Parties are cautioned against using or purchasing imitations or infringements of these patent manufacturers.

PATENT FLEXIBLE TUBING,  
AND BRACHT CLOTH FOR MINES,  
MANUFACTURED BY  
\* ELLIS LEVER,  
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WEST GORTON WORKS, MANCHESTER.

VULCANISED INDIA-RUBBER,  
FOR ENGINEERS AND MECHANICAL PURPOSES.  
VALVES—for Marine and Land Engines' Steam Packing, sheet or roll.  
DRAINAGE AND SUCTION HOSE—for Brewers, Distillers, Fire-engines, Gardens, &c.  
MACHINE BANDS—for all descriptions of Machinery.  
GAS TUBING—with or without wire.  
GAUGE GLASS RINGS; WASHERS.

Price Lists free on application.  
SOUTHWARK INDIA-RUBBER COMPANY (LIMITED),  
67, GRANGE ROAD, BERMONDSEY, LONDON, S.E.

TAVISTOCK IRONWORKS AND STEEL ORDNANCE  
COMPANY (LIMITED).  
(LATE GILL AND CO.)  
ENGINEERS, IRON AND BRASS FOUNDRERS,  
MANUFACTURERS OF  
STEAM ENGINES, BOILERS, AND MACHINERY OF ALL KINDS,  
CHAINS, SHOVELS, EDGE TOOLS, AND EVERY DESCRIPTION OF CAST  
AND HAMMERED IRON FOR MINING, MANUFACTURING,  
RAILWAY, OR AGRICULTURAL PURPOSES.  
Machinery sent to all parts of the world.  
Foreign mining companies supplied on liberal terms.

RAILWAY CARRIAGE COMPANY (LIMITED)  
ESTABLISHED 1847.  
OLD BURY WORKS, NEAR BIRMINGHAM.  
MANUFACTURERS OF RAILWAY CARRIAGES AND WAGONS, and EVERY  
DESCRIPTION OF IRONWORK.  
Passenger carriages and wagons built, either for cash or for payment  
over a period of years.

RAILWAY WAGONS FOR HIRE.  
CHIEF OFFICES, OLD BURY WORKS, NEAR BIRMINGHAM,  
LONDON OFFICES, 6, STOREY'S GATE, GREAT GEORGE STREET,  
WESTMINSTER.

RAILWAY WAGON WORKS, BARNESLEY.—  
CRAIK BROTHERS are PREPARED TO SUPPLY COAL and COKE  
WAGONS OF EVERY DESCRIPTION, either for cash, or by deferred payments  
through wagon-leasing companies.

THE METROPOLITAN RAILWAY CARRIAGE AND  
WAGON COMPANY (LIMITED).  
SALTLEY WORKS (BIRMINGHAM).  
Successors to Messrs. JOSEPH WRIGHT and SONS.

MANUFACTURERS OF RAILWAY CARRIAGES, WAGONS, and RAILWAY  
IRONWORK of every description.  
RAILWAY CARRIAGES AND WAGONS built for CASH, or upon DEFERRED  
PAYMENTS EXTENDING over a period of from THREE to TEN YEARS.  
A large number of COAL, IRONSTONE, BALLAST, and other WAGONS to  
be LET ON HIRE.  
MANUFACTORY and CHIEF OFFICES—SALTLEY WORKS, BIRMINGHAM,  
LONDON OFFICES—No. 8, ADAM STREET, ADELPHI, W.C.

THE BEVERLEY IRON AND WAGON COMPANY  
(LIMITED).  
MANUFACTURERS of RAILWAY CARRIAGES and WAGONS, WROUGHT  
and CAST IRON CARRIAGE and WAGON WHEELS, AXLES, HAMMERED  
USES, and HEAVY SMITHS' WORK for ENGINEERS, &c. BRASS and  
IRON FOUNDRERS. MAKERS of PORTABLE FARM RAILWAYS, TURN-  
TABLES, CROSSINGS, SWITCHES, &c. AGRICULTURAL MACHINISTS.  
MANUFACTURERS of FIELD, ROAD, and BARN IMPLEMENTS, PATENT  
LORRY, CART, and CARRIAGE WHEELS, with WOOD or IRON NAVES,  
REAPING MACHINES, CLOD CRUSHERS, CORN MILLS, &c. SAW MILL  
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RAILWAYS, STATIONS, BARRACKS, EXHIBITIONS, &c.  
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MANUFACTURE RAILWAY WAGONS of EVERY DESCRIPTION, for  
HIRE and SALE, by immediate or deferred payments. They have also wagons  
part of which are constructed specially for shipping purposes. Wagons in working order maintained by contract.  
EDMUND FOWLER, Sec.

WAGON WORKS—SMETHWICK, BIRMINGHAM.  
\* Loans received on Debenture; particulars on application.  
London Agent—Mr. E. B. SAVILE, 67, Victoria-street, Westminster, S.W.

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(LIMITED).  
MANUFACTURERS of RAILWAY CARRIAGE, WAGON, and CONTRAC-  
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STRUCTION of RAILWAY ROLLING STOCK.  
CHIEF OFFICES,  
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MANUFACTURERS OF  
CAST STEEL for PUNCHES, TAPS, and DIES,  
TURNING TOOLS, CHISELS, &c.  
CAST STEEL PISTON RODS, CRANK PINS, CON-  
NECTING RODS, STRAIGHT and CRANK  
AXLES, SHAFTS and  
FORGINGS of EVERY DESCRIPTION.  
DOUBLE SHEAR STEEL FILES MARKED  
BLISTER STEEL, T. TURTON.  
SPRING STEEL, EDGE TOOLS MARKED  
GERMAN STEEL, WM. GREAVES & SON.  
Locomotive Engine, Railway Carriage and Wagon  
Springs and Buffers.

SHEAF WORKS AND SPRING WORKS, SHEFFIELD.  
LONDON WAREHOUSE, 35, QUEEN STREET, CANNON STREET, CITY, E.C.  
Where the largest stock of steel, files, tools, &c., may be selected from.

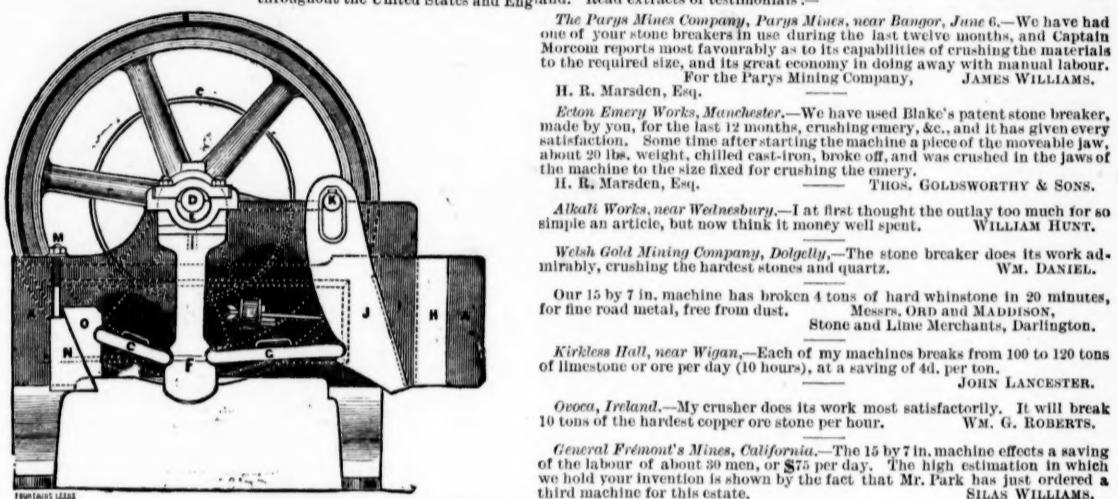
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SALOM'S NEW OPERA and FIELD GLASS, and the  
"RECONNOITERER" GLASS, price 10s. 10d., sent free.—This TOURIST'S  
FAVOURITE, through extraordinary division of labour, distinctly shows small  
windows 10 miles off, and landscapes at 30 miles, Jupiter's moons, &c.—THE MARQUIS  
OF CARMARTHEN: "The reconnoiterer is very good."—THE EARL OF BRED-  
BANE: "I find it all you say, and wonderfully powerful for so very small a glass."  
—EARL OF CAITHNESS: "It is a beautiful glass."—Rev. Lord SCARSDALE "ap-  
proves of it."—Lord GIFFORD, of Ampney: "Most useful."—Lord GAVAGH: "Remarkably good."—Sir DIGBY CAYLEY, of Brompton: "It gives me complete  
satisfaction, and is wonderfully good."—Sir W. H. FIELDER: "I do not think  
it can be surpassed; it gives great satisfaction."—Capt. SENDEY, Royal Small  
Arms Factory, Enfield: "found it effective at 1000 yards range."—F. H. FAWKES,  
of Farnley Hall, Esq.: "I never before, although I have tried many, met a glass  
combining so much power for its size with so much clearness."—The Field: "We  
have carefully tried it at 800-yard rifle range, and found it fully equal to any of  
those present, although they had cost more than four times its price."—Notes  
and Queries: "What intending tourist will now start without such an indispens-  
able companion?" The celebrated HYTHE GLASS shows bullet-marks at  
1200 yards, and men at 3½ miles; price, 31s. 6d. All the above, together with  
the registered trade-marks, "Salom," "Reconnoiterer," and "Hythe,"  
are only to be had direct from SALOM and CO., 98, Princess-street, Edinburgh,  
and 137, Regent-street, London, W.  
A few hours will carry a glass to almost the remotest town in the United  
Kingdom. No agents of any kind anywhere.

## PORTABLE STEAM ENGINES AND BOILERS.

PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862.

## IMMENSE SAVING OF LABOUR.

TO MINERS, IRONMASTERS, MANUFACTURING CHEMISTS, RAILWAY COMPANIES, EMERY AND FLINT  
GRINDERS, MCADAM ROAD MAKERS, &c., &c.BLAKE'S PATENT STONE BREAKER  
OR ORE CRUSHING MACHINE,FOR REDUCING TO SMALL FRAGMENTS ROCKS, ORES, AND MINERALS OF EVERY KIND.  
It is rapidly making its way to all parts of the globe, being now in profitable use in California, Washoe, Lake Superior, Australia, Cuba, Chili, Brazil, and  
England. Read extracts of testimonials:—

For circulars and testimonials, apply to—

H. R. MARSDEN, SOHO FOUNDRY,  
MEADOW LANE, LEEDS,  
ONLY MAKER IN THE UNITED KINGDOM.

## International Exhibition, 1862—Prize Medal.

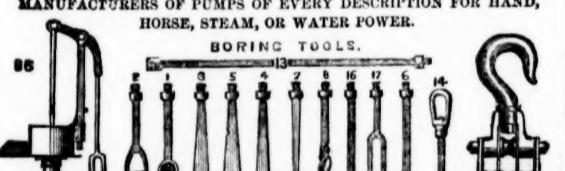
JAMES RUSSELL AND SONS  
(the original patentees and first makers of wrought  
iron tubes), of the CROWN PATENT TUBE WORKS,  
WEDNESBURY, STAFFORDSHIRE, HAVE BEEN  
AWARDED A PRIZE MEDAL for the "good work"  
displayed in their wrought-iron tubes and fittings,  
Warehouse, 81, Upper Ground-street, London, S.

BICKFORD'S PATENT SAFETY-FUSE OBTAINED the  
PRIZE MEDALS at the ROYAL EXHIBITION of 1851, at the INTERNATIONAL EX-  
POSITION held in Paris, in 1865. —

BICKFORD, SMITH, AND CO.,  
of TUCKINGMILL, CORNWALL, MANUFAC-  
TURERS of PATENT SAFETY-FUSE, having been in-  
formed that the name of their firm has been attached to  
fuse not of their manufacture, beg to call the attention of  
the trade and public to the following announcement:—  
EVERY COIL of FUSE MANUFACTURED by them  
has TWO SEPARATE THREADS PASSING THROUGH the COLUMN of  
GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM SUCH TWO SE-  
PARATE THREADS as THEIR TRADE MARK.

S. OWENS AND CO. (LATE CLINTON AND OWENS).  
WHITEFRIARS STREET, FLEET STREET, LONDON, E.C.  
HYDRAULIC AND GENERAL ENGINEERS.

MANUFACTURERS OF PUMPS OF EVERY DESCRIPTION FOR  
HAND, HORSE, STEAM, OR WATER POWER.

BORING TOOLS OF ALL DESCRIPTIONS, for  
Testing Ground and for Artesian Wells.PORTABLE, SINGLE, and DOUBLE BARREL, and  
other PUMPS, and PORTABLE STEAM

ENGINES.

CRABS, CRANES, PULLEY BLOCKS, and  
HOISTING TACKLE.ANY OF THE ABOVE CAN BE HAD ON HIRE  
OR PURCHASE.

Full Information, Drawings, Price Lists, &c., re-  
lating to the above, and to Hydraulic Machinery of all  
descriptions—Crabs, Pulleys, Blocks, and Hoisting  
Tackle of superior manufacture—may be had on ap-  
plication.

GALLOWAY'S PATENT CONE TUBES FOR STEAM  
BOILERS.—The introduction of these vertical taper tubes into the ordi-  
nary flued boilers PROMOTES the NECESSARY CIRCULATION OF WATER,  
and thus INCREASES THEIR STRENGTH and DURABILITY.

Their adoption not only adds to the steam-producing power of the flues, but  
renders the practice of hooping with angle or tee iron rings quite unnecessary.  
The tubes have now been in use upwards of 14 years, and above 22,000 are in  
work in various parts of the country, with the best results.

They can be easily fixed in existing boilers (owing to their taper form) by any  
boiler maker, but can only be obtained from the patentees, W. and J. GALLOWAY  
and SONS, Engineers and Boiler Makers, Manchester.

Just published, price 2s. 6d.,  
A SMALL BOOK ON PUDDLING, containing useful and  
important information for Puddlers, Ironworkers, and others, may be  
obtained through booksellers, or direct from the author. Where workmen and  
others subscribe, and forward a Post-office order, a liberal allowance will be  
made, which will be increased if the number ordered is 24.—For terms, apply to  
B. BAYLISS, Bridge-street, Pontypool, Monmouthshire.

THE COUNTY PAPER.—County advertisements inserted by Authority of  
the Court of Quarter Sessions.

THE FLINT COUNTY CHRONICLE: A Mining, Agricultural  
and General Advertiser for Mold, Flint, Rhyd, Northop, Buckley,  
Hawarden, Saltney, and neighbourhood. The great success which has at-  
tended the publication of the "County Chronicle" justifies the proprietors in  
drawing the attention of advertisers to the special advantages it offers as an ad-  
vertising medium. For the announcements of auctioneers, public companies,  
and tradesmen, it is the best in the country, having attained a circulation  
throughout Flintshire treble that of all the other so-called local papers com-  
bined. As a newspaper it contains full and impartial reports of all local events,  
and devotes particular attention to the mining and oil trade interests of the dis-  
trict—special articles appearing from week to week. Agriculture is not neg-  
lected, the latest market reports being a distinctive feature of the paper, to-  
gether with other matters of interest to the agriculturist. All communica-  
tions should be addressed "To the Editor," Bromfield Villa, Maesdderwen, Mold.

THE WREXHAM ADVERTISER, DENBIGHSHIRE, FLINT-  
SHIRE, SHROPSHIRE, CHESHIRE, AND NORTH WALES REGISTER  
(Established 1848).—The town of Wrexham forms the centre of a large and im-  
portant agricultural and mining district, which, from the increasing attention  
of capitalists, aided by the advantages afforded by new railways, is rapidly in-  
creasing in population, and bids fair to rival Wolverhampton in commercial  
importance. The Advertiser, partaking of the general prosperity, has largely  
increased its weekly circulation, 1000 more copies being now issued of each im-  
pression than at the close of 1864, and it now has a circulation more than dou-  
ble that of any other paper published in Denbighshire and Flintshire, and is the  
only medium by which advertising can fully and effectually communicate with  
the public generally in those counties. Price 2d., stamped 3d. Published by  
Bayley and Bradley, Advertiser office, Wrexham.

THE NEWCASTLE CHRONICLE AND NORTHERN  
COUNTIES ADVERTISER. (ESTABLISHED 1764.)  
Published every Saturday, price 2d., or quarterly 2s. 2d.  
Offices, 42, Grey-street, Newcastle-upon-Tyne; 50, Howard-street, North  
Shields; 195, High-street, Sunderland.

THE STOCKTON AND HARTLEPOOL MERCURY AND  
MIDDLESBROUGH NEWS (published at Hartlepool) is eminently the  
organ of the Coal, Iron, and Iron Shipbuilding Trades in the extensive Mining  
and Maritime District of South Durham and Cleveland, with which it has been  
closely identified since its origin. The "Mercury" was for years the only news-  
paper published in South Durham and Cleveland, and is yet the only one pub-  
lished more than once a week. Advertisements to be forwarded to the publisher,  
Mr. JOHN H. BELL, Southgate, Hartlepool.

DR. WATSON (of the Lock Hospital), F.R.A.S., Member of the  
College of Physicians and Surgeons, on the SELF-CURE of NERVOUS  
and PHYSICAL DEBILITY, Lowness of Spirits, Loss of Appetite, Timidity, In-  
capacity for Exertion, &c., with means for perfect restoration. Sent free for  
two stamps by Dr. WATSON, No. 1, South-crescent, Bedford-square, London.  
Consultations daily from Eleven till Three, and Six till Eight.

Just published, post free for two stamps,  
WONDERFUL MEDICAL DISCOVERY, demonstrating the  
true causes of Nervous, Mental, and Physical Debility, Lowness of Spirits,  
Indigestion, Want of Energy, Premature Decline, with plain directions for per-  
fect restoration to health and vigour, WITHOUT MEDICINE. Sent free on re-  
ceipt of two stamps, by W. HILL, Esq., M.A., Berkeley House, South-crescent,  
Russell-square, London, W.C.

NERVOUS DEBILITY: ITS CAUSE AND CURE.—Before  
seeking aid from the so-called remedies without medicine, read this va-  
luable work on the Treatment and Cure of Nervous and Physical Debility, Loss  
of Appetite, Pains in the Back, Spermatorrhœa, &c., with Plain Directions for  
Perfect Restoration to Health. Sent post free to any address, on receipt of two  
postage stamps. Letters of enquiry or details of case promptly answered.  
Address, Dr. SMITH, 8, Burton-crescent, London, W.C.

CONSULT DR. HAMMOND (of the Lock Hospital, &c.),  
No. 11, Charlotte-street, Bedford-square, London, W.C., in all those aliments  
which tend to embitter and shorten life, and especially those termed peculiar and  
confidential. At home, Nine to Two, and Six to Eight; Sundays, Ten to Twelve.  
The "Self-Curative Guide" post free, six stamps.

N.B.—Cases of recent infection cured in two days.  
Just published, free six stamps,  
LITERARY PHOTOGRAPHS; or SECRET LIFE PICTURES.  
In a series of Six Tableaux. Dedicated to husbands, bachelors, and  
widowers: with medical hints to all classes of both sexes. Sent post free on  
receipt of six stamps, by H. JAMES, Esq., Percy-house, Bedford-square, London.

## THE MINING SHARE LIST.

## BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Pershare.	Last paid.	Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Pershare.	Last Call.		
200 Ballatack, t, St. Just	.....	51	5 0..	..	270 300	488 15 0..	5 0 0..	May, 1866	1200 Alderley Edge, c, Cheshire	10	0 0..	..	..	..	July, 1866		
20000 British Ship Company	.....	8	0 0..	..	..	9 percent.	..	3000 Bedford Unit, t, Tavistock	2	6 8..	..	..	..	..	Aug. 1866		
1000 Broniford, t, Cardigan	.....	12	0 0..	..	..	8 1..	0 0..	3000 Bedol Kur, t, Holywell	1	2 0..	..	..	..	..	July, 1866		
916 Cargoll, s-l, Newlyn	.....	15	5 7..	15	12 13	..	13 15 0..	1 0 0..	3000 Billins, t, Flint	30	0 0..	..	..	..	..	May, 1866	
867 Cwm Eirin, t, Cardiganshire	.....	7	10 0..	..	..	20 0 0..	1 0 0..	Feb, 1866	1000 Blaenbyfrn, s-l	2	0 0..	..	..	..	..	Sept. 1866	
128 Cwmystwyth, t, Cardiganshire	.....	60	0 0..	..	..	352 10 0..	5 0 0..	Apr., 1866	1000 Blaenbyfrn, s-l	2	0 0..	..	..	..	..	Feb. 1866	
280 Devon Mines, s-l, Durham	.....	300	0 0..	..	..	162 0 0..	2 10 0..	Mar. 1866	1000 Blaenbyfrn, s-l	2	0 0..	..	..	..	..	May, 1866	
1024 Devon Gt. Consols, t, Tavistock	.....	1	0 0..	..	..	420 440	1030 0 0..	6 0 0..	June, 1866	1000 Blaenbyfrn, s-l	2	0 0..	..	..	..	..	..
338 Dolcoath, c, t, Camborne	.....	198	17 6..	7	6 8 6%	..	813 10 0..	1 0 0..	June, 1866	1248 Boscastle, t, St. Just	6	15 0..	..	..	..	..	..
6144 East Caradon, c, St. Cleer	.....	2	14 6..	7	6 8 6%	..	14 5 6..	0 2 6..	July, 1866	5000 Botts Hill, t, Plymton	1	14 6..	..	..	..	..	..
300 East Darren, t, Cardiganshire	.....	32	0 0..	..	..	113 10 0..	2 0 0..	May, 1866	1600 Brixham Hematite Iron	6	7 6..	..	..	..	..	..	
122 East Pool, t, c, Pool, Illogan	.....	24	5 0..	..	..	379 0 0..	5 0 0..	July, 1866	2000 Brynford Hall, t, Flint	28	0 0..	..	..	..	..	..	
5000 East Rosewarne, c, t, Gwinear	.....	2	15 0..	..	..	470 0 0..	3 0 0..	May, 1866	1000 Bryn Gwlog, t, Flint	2	0 0..	..	..	..	..	..	
1906 East Wheal Lovell, t, Wendron	.....	3	9 0..	6	..	2 7 6..	0 1 6..	Jan., 1866	1000 Carn Brea, c, Illogan	21	0 0..	..	..	..	..	..	
5000 Frank Mills, t, Christow	.....	25	0 0..	..	..	68 10 0..	0 10 0..	June, 1866	6000 Carn Camborne, c, Camborne	2	0 0..	..	..	..	..	..	
15000 Great Laxey, t, Isle of Man	.....	4	0 0..	..	..	45 13 0..	0 10 0..	June, 1866	20000 Cardigan Cons., t, (1000 £5 pd.)	3005	£4 58 pd.	..	..	..	..	..	
5908 Great Wheal Vor, t, c, Helston	.....	49	0 0..	..	..	18 18 0..	1 0 0..	June, 1866	60000 Camborne Consols, c, Camborne	1	5 0..	..	..	..	..	..	
1024 Herdfoot, t, near Liskeard	.....	8	10 0..	32	..	37 10 0..	1 10 0..	May, 1866	200000 Camborne Consols, c, Camborne	1	12 6..	..	..	..	..	..	
6000 Hindston Down, c, t	.....	5	10 6..	34	..	0 10 0..	0 5 0..	April, 1866	100000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
4000 Lisburne, t, Cardiganshire, Wales	.....	18	15 0..	..	..	470 0 0..	3 0 0..	May, 1866	150000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
9000 Marke Valley, c, Caradon	.....	4	10 6..	4	..	3 3 8 3%	..	..	500000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
3000 Miner's Boundary, t, Wrexham	.....	1	0 0..	..	..	13 0 0..	0 3 0..	Mar., 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
1800 Minera Mining Co., t, Wrexham	.....	25	0 0..	..	..	198 3 0..	5 0 0..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
40000 Mwyndy Iron Ore	.....	3	5 0..	..	..	10 0..	0 0..	..	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
600 Pant-y-Gilien, s-l, *.	.....	1	0 0..	..	..	157 0 0..	5 0 0..	Jan., 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
200 Parys Mines, c, Anglesey	.....	50	0 0..	..	..	18 1 0..	0 0..	..	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
1120 Providence, t, Uy Lelant	.....	10	6 7..	25	..	20 24	80 17 6..	0 10 0..	May, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..
512 South Caradon, c, St. Cleer	.....	1	5 0..	..	..	529 10 0..	1 0 0..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
6000 South Darren, t	.....	3	6 6..	..	..	0 5 6..	0 2 6..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
6000 Tincroft, c, Pool, Illogan	.....	9	0 0..	10	..	81 6 9%	18 1 0..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
3000 W. Chilverton, t, Perranzabuloe	.....	7	0 0..	..	..	7 6 6..	1 1 0..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
400 West Wheal Seton, c, Camborne	.....	47	10 0..	110	..	100 110	456 4 0..	0 0..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..
512 Wheal Basset, c, Illogan	.....	5	2 6..	..	..	620 0 0..	1 0 0..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
1024 Wheal Exmouth, t, Christow	.....	20	0 0..	..	..	300 0 0..	1 0 0..	Mar., 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
4295 Wheal Kitty, t, St. Agnes	.....	5	4 6..	..	..	2 19 0 0..	1 0 6..	May, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
2000 Wheal Rose, c, Scorrier	.....	10	..	8 9	..	1 0 0..	0 10 0..	Feb., 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
396 Wheal Seton, c, t, Camborne	.....	58	10 0..	150	..	226 15 0..	5 5 0..	April, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..	
1040 Wheal Trelawny, t, Liskeard	.....	5	17 0..	..	..	8 10	34 0 6..	0 5 0..	June, 1866	1000000 Camborne Consols, c, Camborne	1	15 0..	..	..	..	..	..

## BRITISH MINES WITH DIVIDENDS IN ABEYANCE.

Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Pershare.	Last paid.	Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Pershare.	Last Call.
1055 Craddock Moor, c, St. Cleer	.....	10	11 0..	..	..	7 12 0..	0 4 0..	June, 1866	1200 Alderley Edge, c, Cheshire	10	0 0..	..	..	..	July, 1866
1200 Bryn Gwyn, t, Mold	.....	9	0 0..	..	..	3 3 6..	0 18 6..	Aug., 1866	3000 Bedford Unit, t, Tavistock	2	6 8..	..	..	..	Aug., 1866
2880 Clifford Amalgamated, c, Gwen	.....	30	10 0..	5 1/2	..	35 6 0..	0 10 0..	June, 1866	3000 Bodmin, t, Redruth	18	0 0..	..	..	..	Aug., 1866
6000 East Carn Brea, c, Redruth	.....	315	0 0..	1 1/2	..	0 5 0..	0 5 0..	June, 1866	6000 Bodmin, t, Redruth	18	0 0..	..	..	..	Aug., 1866
20000 Mining Co. of Ireland, c, t, l	.....	7	0 0..	..	..</										